GROUP 00

GENERAL

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HOW TO USE THIS MANUAL

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MAINTENANCE, REPAIR AND SERVICING EXPLANATIONS

This manual provides explanations, etc. concerning procedures for the inspection, maintenance, repair and servicing of the subject model. Unless otherwise specified, each service procedure covers all models. Procedures covering specific models are identified by the model codes, or similar designation (engine type, transaxle type, etc.). A description of these designations is covered in this manual under "VEHICLE IDENTIFICATION."

ON-VEHICLE SERVICE

The "ON-VEHICLE SERVICE" section has procedures for performing inspections and adjustments of particularly important components. These procedures are done with regard to maintenance and servicing, but other inspections (looseness, play, cracking, damage, etc.) must also be performed.

SERVICE PROCEDURES

The service steps are arranged in numerical order. Attention to be paid in performing vehicle service are described in detail in SERVICE POINTS.

DEFINITION OF TERMS

STANDARD VALUE

Indicates the value used as the standard for judging whether or not a part or adjustment is correct.

LIMIT

Shows the maximum or minimum value for judging whether or not a part or adjustment is acceptable.

REFERENCE VALUE

Indicates the adjustment value prior to starting the work (presented in order to facilitate assembly and adjustment procedures, and so they can be completed in a shorter time).

DANGER, WARNING, AND CAUTION

DANGER, WARNING, and CAUTION call special attention to a necessary action or to an action that must be avoided. The differences among DANGER, WARNING, and CAUTION are as follows:

- If a DANGER is not followed, the result is severe bodily harm or even death.
- If a WARNING is not followed, the result could be bodily injury.
- If a CAUTION is not followed, the result could be damage to the vehicle, vehicle components or service equipment.

TIGHTENING TORQUE INDICATION

The tightening torque indicates a median and its tolerance by a unit of N· m (in-lb) or N· m (ft-lb). For fasteners with no assigned torque value, refer to P.00-32.

SPECIAL TOOL NOTE

Only MMC special tool part numbers are called out in the repair sections of this manual. Please refer to the special tool cross-reference chart located at the beginning of each group, for the special tool number that is available in your market.

ABBREVIATIONS

The following abbreviations are used in this manual for classification of model types:

M/T: Manual transaxle, or models equipped with manual transaxle.
A/T:Automatic transaxle, or models equipped with automatic transaxle.
MFI: Multiport fuel injection, or engines equipped with multiport fuel injection.
FWD: 2-wheel drive vehicles.
AWD: 4-wheel drive vehicles.
A/C: Air conditioning.
2.4L Engine: 2.4 liter <4G69> engine, or a model equipped with such an engine.
PCM: Powertrain control module
SWS: Simplified wiring system

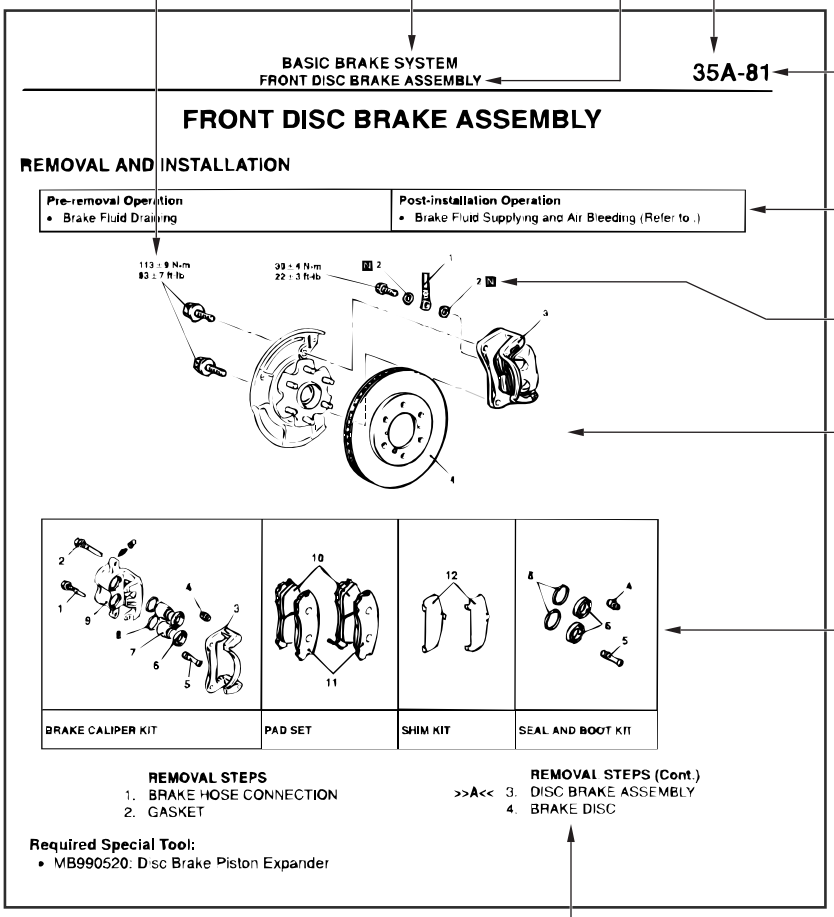
EXPLANATION OF MANUAL CONTENTS

Indicates the section title.

Denotes tightening torque. If there is no indication of tightening torque, refer to tightening torque.

Indicates the group title.

Indicates the group number.



Indicates the page number.

Indicates procedures to be performed before the work in that section is started, and procedures to be performed after the work in that section is finished.

Mark **N** denotes non-reusable part.

Component diagram
A diagram of the component parts is provided near the front of each section in order to give the reader a better understanding of the installed condition of component parts.

Repair kit or parts sets are shown.
(Only very frequently used parts are shown.)

Maintenance and servicing procedures

The numbers provided within the diagram indicate the sequence for maintenance and servicing procedures.

- Removal steps :
  The part designation number corresponds to the number in the illustration to indicate removal steps.
- Disassembly steps :
  The part designation number corresponds to the number in the illustration to indicate disassembly steps.
- Installation steps :
  Specified in case installation is impossible in reverse order of removal steps. Omitted if installation is possible in reverse order of removal steps.
- Assembly steps :
  Specified in case installation is impossible in reverse order of removal steps. Omitted if assembly is possible in reverse order of disassembly steps.

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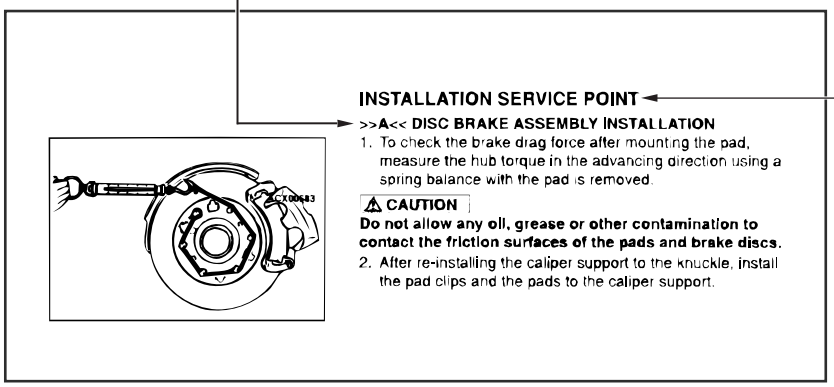
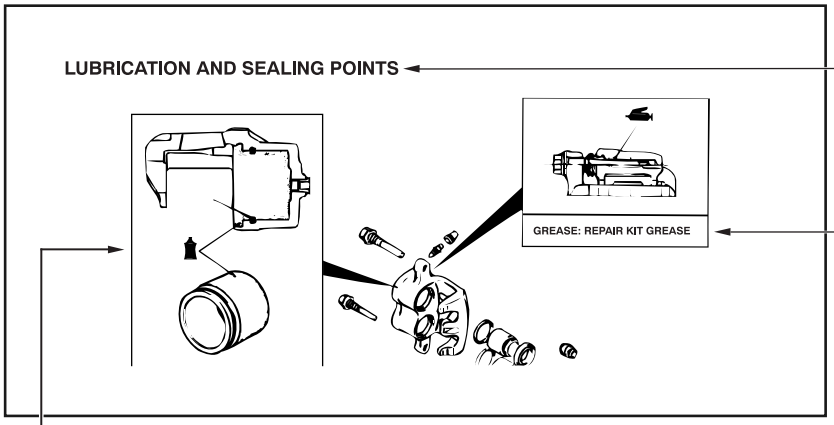
Classifications of major maintenance / service points

When there are major points relative to maintenance and servicing procedures (such as essential maintenance and service points, maintenance and service standard values, information regarding the use of special tools, etc.). These are arranged together as major maintenance and service points and explained in detail.

<<A>> : Indicates that there are essential points for removal or disassembly.
>>A<< : Indicates that there are essential points for installation or assembly.


INSTALLATION SERVICE POINT
>>A<< DISC BRAKE ASSEMBLY INSTALLATION
1. To check the brake drag force after mounting the pad, measure the hub torque in the advancing direction using a spring balance with the pad is removed.
CAUTION
Do not allow any oil, grease or other contamination to contact the friction surfaces of the pads and brake discs.
2. After re-installing the caliper support to the knuckle, install the pad clips and the pads to the caliper support.

Operating procedures, cautions, etc. on removal, installation, disassembly and assembly are described



The title of the page (following the page on which the diagram of component parts is presented) indicating the locations of lubrication and sealing procedures.

Indicates (by symbols) where lubrication is necessary.

Symbols for lubrication, sealants and adhesives

Symbols are used to show the locations for lubrication and for application of sealants and adhesives. These symbols are included in the diagram of component parts or on the page following the component parts page. The symbols do not always have accompanying text to support that symbol.

- : Grease (Multi-purpose grease unless there is a brand or type specified)
- : Sealant or adhesive
- : Brake fluid or automatic transmission fluid
- : Engine oil, gear oil or air conditioning compressor oil
- : Adhesive tape or butyl rubber tape

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TROUBLESHOOTING GUIDELINES

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VERIFY THE COMPLAINT

- Make sure the customer's complaint and the service writer's work order description are understood before starting work.
- Make sure the correct operation of the system is understood. Read the service manual description to verify normal system operation.
- Operate the system to see the symptoms. Look for other symptoms that were not reported by the customer, or on the work order, that may be related to the problem.

DETERMINE POSSIBLE CAUSES

Compare the confirmed symptoms to the diagnostic symptom indexes to find the right diagnosis procedure.
If the confirmed symptoms cannot be found on any symptom index, determine other possible causes.

- Analyze the system diagrams and list all possible causes for the problem symptoms.
- Rank all these possible causes in order of probability, based on how much of the system they cover, how likely they are to be the cause, and how easy they will be to check. Be sure to take experience into account. Consider the causes of similar problems seen in the past. The list of causes should be ranked in order from general to specific, from most-likely to least-likely, and from easy-to-check to hard-to-check.

FIND THE PROBLEM

After the symptoms have been confirmed, and probable causes have been identified, the next step is to make step-by-step checks of the suspected system components, junctions, and links in logical order.
Use the diagnostic procedures in the service manual whenever possible. Follow these procedures carefully to avoid missing an important step in the diagnosis sequence. It might be the skipped step that leads to the solution of the problem.
If the service manual doesn't have step-by-step procedures to help diagnose the problem, make a series of checks based on the ranked list of probable causes. Troubleshooting checks should be made in the order that the list of causes was ranked:

- general to specific
- most-likely to least-likely
- easy-to-check to hard-to-check

REPAIR THE PROBLEM

When the step-by-step troubleshooting checks find a fault, perform the proper repairs. Make sure to fix the root cause of the problem, not just the symptom. Just fixing the symptom, without fixing the root cause, will cause the symptom to eventually return.

VERIFY THE REPAIR

After repairs are made, recheck the operation of the system to confirm that the problem is eliminated. Be sure to check the system thoroughly. Sometimes new problems are revealed after repairs have been made.

HOW TO USE TROUBLESHOOTING/INSPECTION SERVICE POINTS

TROUBLESHOOTING CONTENTS

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Troubleshooting of electronic control systems for which the scan tool can be used follows the basic outline described below. Even in systems for which the scan tool cannot be used, part of these systems still follow this outline.

1. STANDARD FLOW OF DIAGNOSTIC TROUBLESHOOTING

Troubleshooting strategy is shown in each group.

2. SYSTEM OPERATION AND SYMPTOM VERIFICATION TESTS

If verification of the symptom(s) is difficult, procedures for checking operation and verifying symptoms are shown.

3. DIAGNOSTIC FUNCTION

The following trouble code diagnosis are shown.

- How to read diagnostic trouble codes
- How to erase diagnostic trouble codes
- Input inspection service points

4. DIAGNOSTIC TROUBLE CODE CHART

If the scan tool displays a diagnostic trouble code, find the applicable inspection procedure according to this chart.

5. SYMPTOM CHART

If there are symptoms, even though the scan tools show that no DTCs are set, inspection procedures for each symptom will be found by using this chart.

6. DIAGNOSTIC TROUBLE CODE PROCEDURES

Indicates the inspection procedures corresponding to each diagnostic trouble code. (Refer to P.00-8).

7. SYMPTOM PROCEDURES

Indicates the inspection procedures corresponding to each symptom listed in the Symptom Chart. (Refer to P.00-8).

8. SERVICE DATA REFERENCE TABLE

Inspection items and normal judgment values have been provided in this chart as reference information.

9. CHECK AT ECU TERMINALS

Terminal numbers for the ECU connectors, inspection items, and standard values have been provided in this chart as reference information.

TERMINAL VOLTAGE CHECKS

1. Connect a needle-nosed wire probe to a voltmeter probe.

⚠ CAUTION

Short-circuiting the positive (+) probe between a connector terminal and ground could damage the vehicle wiring, the sensor, the ECU, or all three. Use care to prevent this!

2. Insert the needle-nosed wire probe into each of the ECU connector terminals from the wire side, and measure the voltage while referring to the check chart.

   NOTE: Measure voltage with the ECU connectors connected.
   You may find it convenient to pull out the ECU to make it easier to reach the connector terminals. Checks don't have to be carried out in the order given in the chart.

3. If voltage readings differ from normal condition values, check related sensors, actuators, and wiring. Replace or repair as needed.
4. After repair or replacement, recheck with the voltmeter to confirm that the repair has corrected the problem.

TERMINAL RESISTANCE AND CONTINUITY CHECKS

1. Turn the ignition switch to the "LOCK" (OFF) position.
2. Disconnect the ECU connector.

⚠ CAUTION

If resistance and continuity checks are performed on the wrong terminals, damage to the vehicle wiring, sensors, ECU, and/or ohmmeter may occur. Use care to prevent this!

3. Measure the resistance and check for continuity between the terminals of the ECU harness-side connector while referring to the check chart.

   NOTE: Checks don't have to be carried out in the order given in the chart.

4. If the ohmmeter shows any deviation from the Normal Condition value, check the corresponding sensor, actuator and related electrical wiring, then repair or replace.
5. After repair or replacement, recheck with the ohmmeter to confirm that the repair has corrected the problem.

10. INSPECTION PROCEDURES USING AN OSCILLOSCOPE

When there are inspection procedures using an oscilloscope, these are listed.

HOW TO USE THE INSPECTION PROCEDURES

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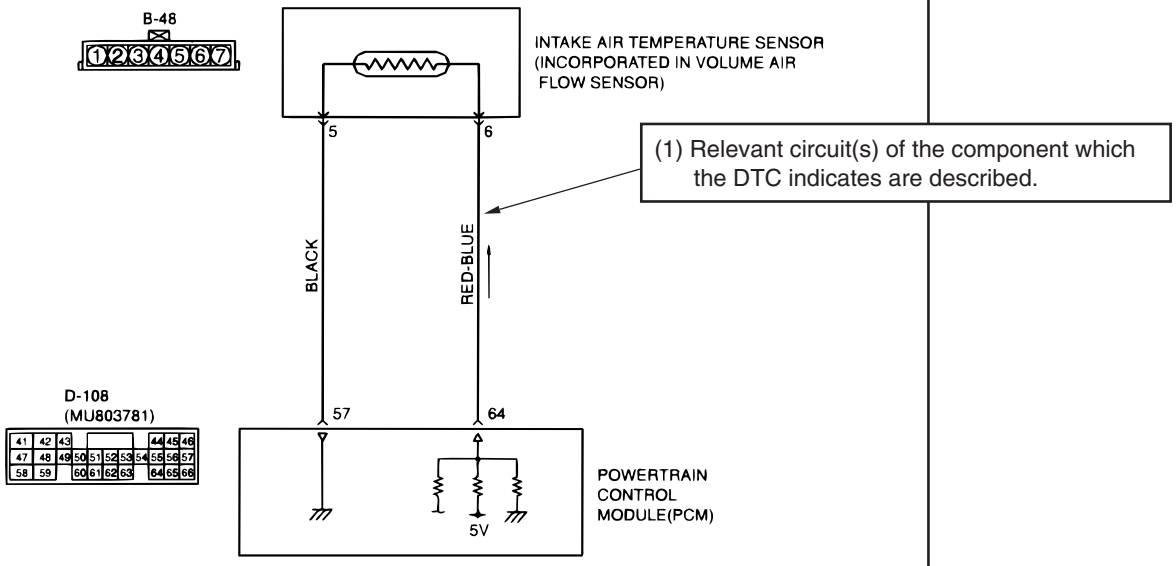
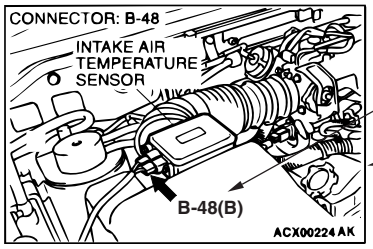
The causes of many of the problems occurring in electric circuitry are generally the connectors, components, the ECU, and the harnesses between connectors, in that order. These inspection procedures follow this order. They first try to discover a problem with a connector or a defective component.

DTC P0110: Intake Air Temperature Circuit Malfunction



(1) Relevant circuit(s) of the component which the DTC indicates are described.

(2) For connector color, refer to GROUP 80A, How to read configuration diagrams.



(3) Shows the location of the connector(s) from the circuit(s) above.

(4) Explains about the operation principle of the component or its relevant parts in that circuit.

CIRCUIT OPERATION

- Approximately 5 volts are applied to the intake air temperature sensor output terminal (terminal 6) from the PCM (terminal 64) via the resistor in the PCM. The ground terminal (terminal 5) is grounded with or PCM (terminal 57).
- The intake air temperature sensor is a negative temperature coefficient type of resistor. When the intake air temperature rises, the resistance decreases.
- The intake air temperature sensor output voltage increases when the resistance increases and decreases when the resistance decreases.

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(5) Explains about technical details.

(6) Describes the conditions for that DTC being set (stored).

TECHNICAL DESCRIPTION

- The engine coolant temperature sensor converts the engine coolant temperature to a voltage and output it.
- The PCM checks whether this voltage is within a specified range.

(7) Describes possible cause(s)for that DTC.

DTC SET CONDITIONS

Check Conditions

- Engine coolant temperature was 7°C (45°F) or more immediately before the engine was stopped at the last drive.

TROUBLESHOOTING HINTS (The most likely causes for this code to be set are:)

- Engine coolant temperature sensor failed.
- Open or shorted engine coolant temperature sensor circuit, or loose connector.
- PCM failed.

(8) Start of the diagnosis procedure for that DTC.

DIAGNOSIS

Required Special Tool:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: USB Cable
  - MB991910: Main Harness A

(9) Identifies the special tool(s) necessary for diagnosing that DTC.

STEP 1. Using scan tool MB991958, check data list item 15: Transmission Fluid Temperature Sensor.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.

(2) Start the engine.

(3) Set scan tool MB991958 to the data reading mode for item 15, Transmission Fluid Temperature Sensor.

- When the engine is cool: Almost equal to the ambient temperature (atmospheric temperature)

NOTE: Set scan tool MB991958 to data reading mode for item number 13, Intake Air Temperature (IAT) Sensor and note the temperature measurement. When the engine is cool, the temperature should be almost equal to the ambient temperature (atmospheric temperature), and the IAT sensor measurement should be approximately the same as the Transmission Fluid Temperature Sensor.

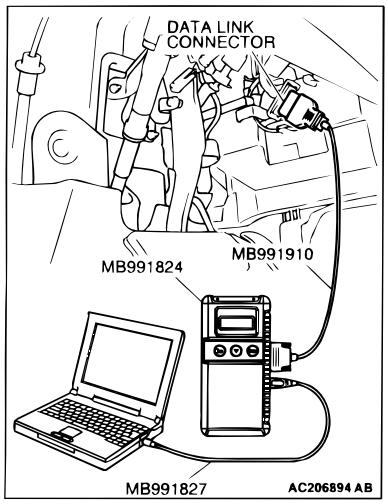
- When the engine is warm: 70 to 80°C (158 to 176°F)

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor operating properly?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/ Inspection Service Points – How to Cope with Intermittent Malfunction .

NO : Go to Step 2.



(10) Provides the inspection procedure for that DTC step by step.

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HARNESS INSPECTION

Check for an open or short circuit in the harness between the terminals which were faulty according to the connector measurements. Carry out this inspection while referring to GROUP 00E, Harness Connector Inspection P.00E-2. Here, "Check harness between power supply and terminal xx" also includes checking for blown fuse. For inspection service points when there is a blown fuse, refer to "Inspection Service Points for a Blown Fuse P.00-15."

MEASURES TO TAKE AFTER REPLACING THE ECU

If the trouble symptoms have not disappeared even after replacing the ECU, repeat the inspection procedure from the beginning.

CONNECTOR MEASUREMENT SERVICE POINTS

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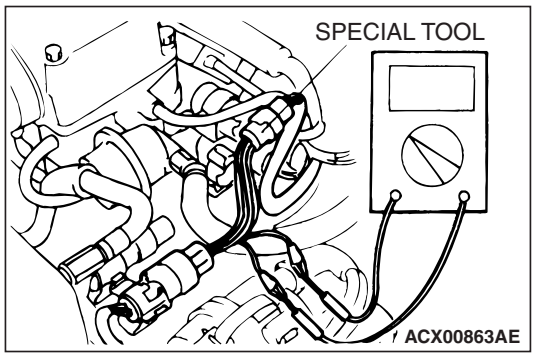
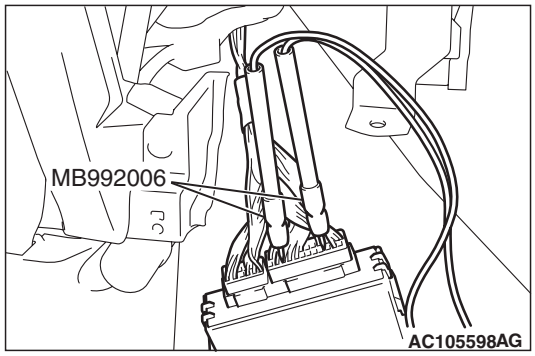
Turn the ignition switch to the "LOCK" (OFF) position when connecting and disconnecting the connectors. Turn the ignition switch to "ON" when measuring, unless there are instructions to the contrary.

IF INSPECTING WITH THE CONNECTOR CONNECTED <WATERPROOF CONNECTORS>



Be sure to use special tool. Never insert a test probe from the harness side, as this will reduce the waterproof performance and result in corrosion.

IF INSPECTING WITH THE CONNECTOR CONNECTED <ORDINARY (NON-WATERPROOF) CONNECTORS>



Required Special Tool:

- MB992006: Extra Fine Probe

Inspect by inserting a test probe from the harness side. If the connector is too small to insert a test probe (e.g. control unit connector), do not insert it forcibly. Use special tool MB992006 (extra fine probe).

IF INSPECTING WITH THE CONNECTOR DISCONNECTED

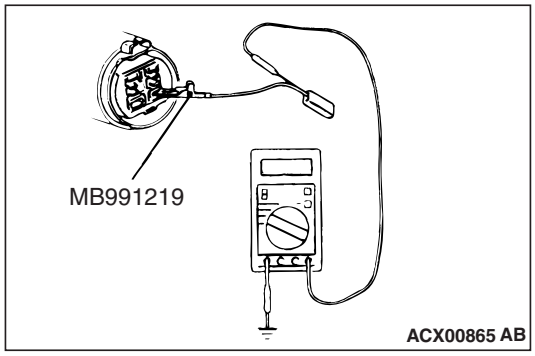
<When Inspecting a Female Pin>

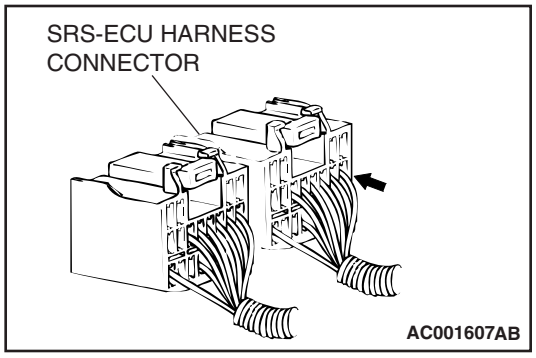
- From front side of the connector

  Required Special Tool:

  MB991219: Inspection Harness (Included in MB991223, Harness Set)

  The inspection harness for connector pin contact pressure should be used. The test probe should never be forcibly inserted, as it may cause a defective contact.





- From back side of the connector (SRS-ECU harness side connector)

  Since the SRS-ECU harness connector is plated to improve conductivity, observe the warning below when checking this connector.

⚠ *WARNING*

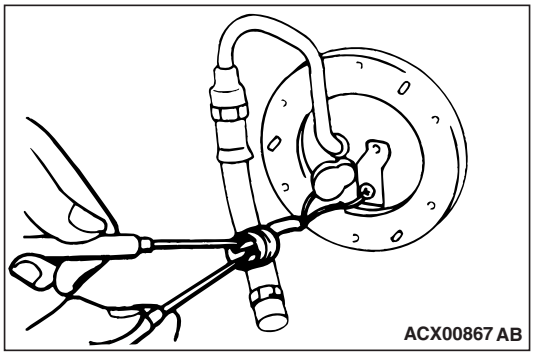
Insert the backprobing tool into the connector from the harness side, and connect the tester to the backprobing tool. If any tool other than the backprobing tool is used, it may cause damage to the harness and other components. Furthermore, measurement should not be carried out by touching the backprobing tool directly against the terminals from the front of the connector. The terminals are plated to increase their conductivity, so that if they are touched directly by the backprobing tool, the plating may break, which will decrease reliability.

<When Inspecting a Male Pin>

⚠ CAUTION

At this time, be careful not to short the connector pins with the test probes. Doing so may damage the circuits inside the ECU.

Touch the pin directly with the test probe.



CONNECTOR INSPECTION SERVICE POINTS

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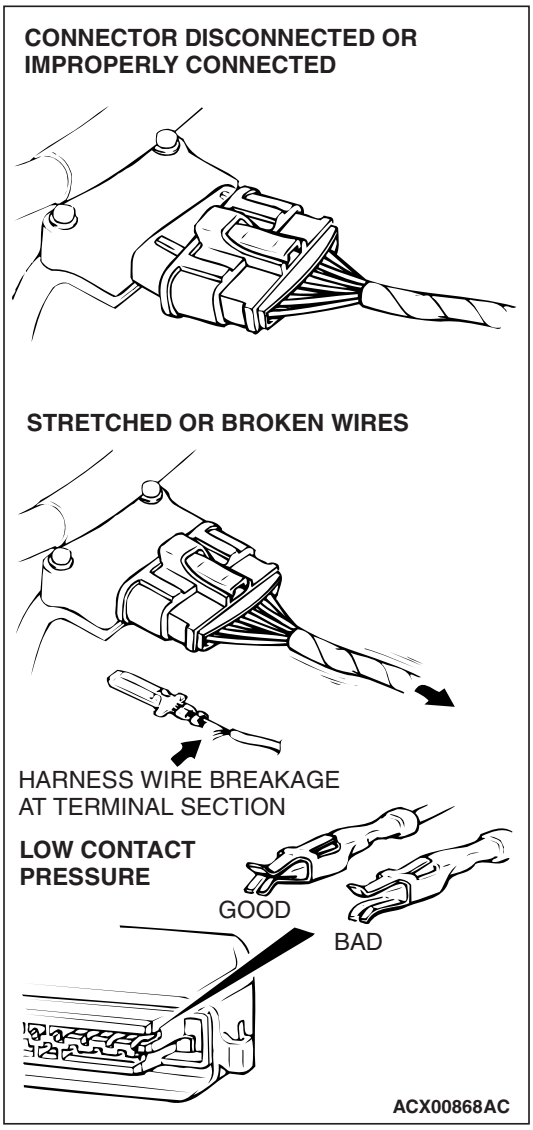
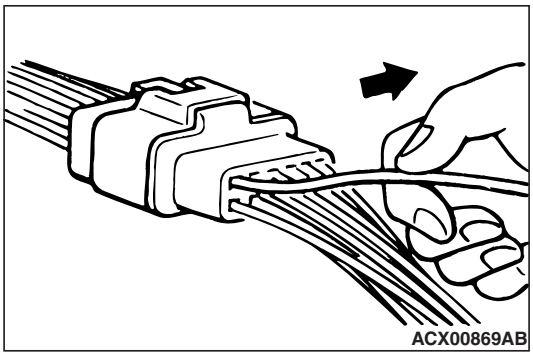
VISUAL INSPECTION

- Connector is disconnected or improperly connected
- Connector pins are pulled out
- Stretched an broken wires at terminal section
- Low contact pressure between male and female terminals
- Low connection pressure due to rusted terminals or foreign matter lodged in terminals



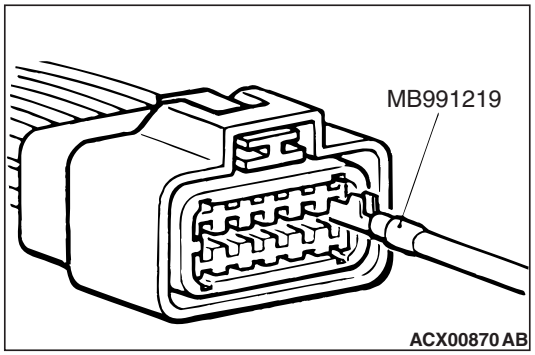
CONNECTOR PIN INSPECTION

If the connector pin stopper is damaged, the terminal connections (male and female pins) will not be perfect even when the connector body is connected, because the pins may pull out of the back side of the connector. Therefore, gently pull the wires one by one to make sure that no pins pull out of the connector.



CONNECTOR ENGAGEMENT INSPECTION

Required Special Tool:
MB991219: Inspection Harness (contained in MB991223 Test Harness)
Use special tool, MB991219 to inspect the engagement of the male pins and female pins. [Pin drawing force: 1 N (0.2 pound) or more]



HOW TO COPE WITH INTERMITTENT MALFUNCTIONS

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Most intermittent malfunctions occur under certain conditions. If those conditions can be identified, the cause will be easier to find.

TO COPE WITH INTERMITTENT MALFUNCTION;

1. ASK THE CUSTOMER ABOUT THE MALFUNCTION

Ask what it feels like, what it sounds like, etc. Then ask about driving conditions, weather, frequency of occurrence, and so on.

2. DETERMINE THE CONDITIONS FROM THE CUSTOMER'S RESPONSES

Typically, almost all intermittent malfunctions occur from conditions like vibration, temperature and/or moisture change, poor connections. From the customer's responses, it should be reasoned which condition is most likely.

3. USE SIMULATION TEST

Use the simulation tests below to attempt to duplicate the customer's complaint. Determine the most likely circuit(s) and perform the simulation tests on the connectors and parts of that circuit(s). Be sure to use the inspection procedures provided for diagnostic trouble codes and trouble symptoms.
For temperature and/or moisture condition related intermittent malfunctions, try to change the conditions of the suspected circuit components, then use the simulation tests below.

4. VERIFY THE INTERMITTENT MALFUNCTION IS ELIMINATED

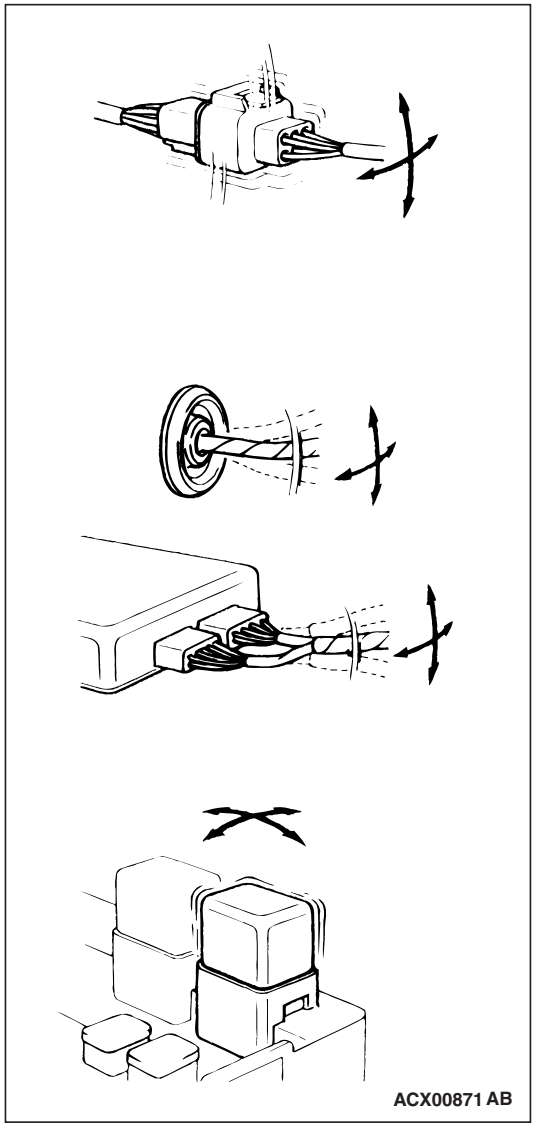
Repair the malfunctioning part and try to duplicate the condition(s) again to verify the intermittent malfunction has been eliminated.

SIMULATION TESTS

NOTE: In case of difficulty in finding the cause of the intermittent malfunction, the data recorder function in the scan tool is effective.

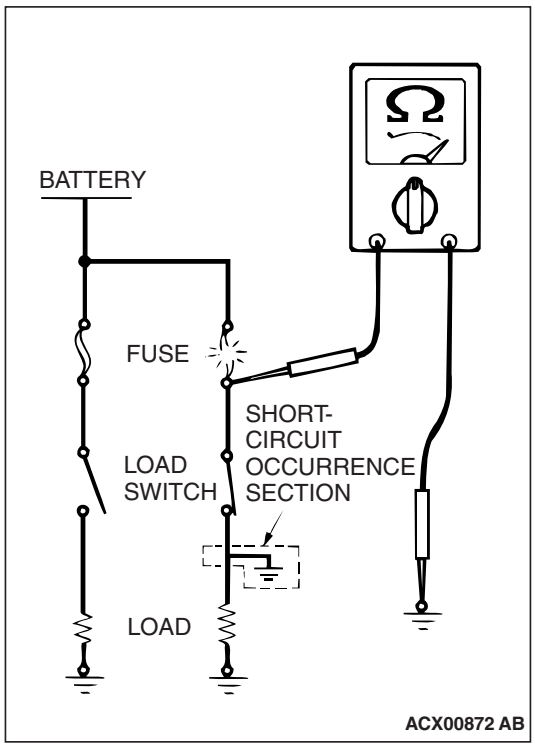
For these simulation tests, shake, then gently bend, pull, and twist the wiring of each of these examples to duplicate the intermittent malfunction.

- Shake the connector up-and-down, and right-and-left.
- Shake the wiring harness up-and-down, and right-and-left. Especially, check the splice points of wiring harnesses carefully. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.
- Shake the part or sensor.


ACX00871 AB

INSPECTION SERVICE POINTS FOR A BLOWN FUSE

M1001013800108



Remove the blown fuse and measure the resistance between the load side of the blown fuse and the ground. Close the switches of all circuits which are connected to this fuse. If the resistance is almost 0 Ω at this time, there is a short somewhere between these switches and the load. If the resistance is not 0 Ω, there is no short at the present time, but a momentary short has probably caused the fuse to blow.
The main causes of a short circuit are the following.

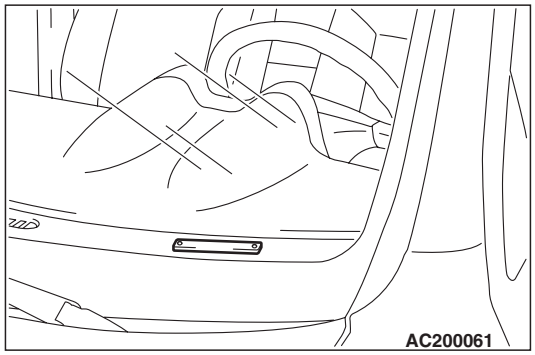
- Harness being clamped by the vehicle body
- Damage to the outer casing of the harness due to wear or heat
- Water getting into the connector or circuitry
- Human error (mistakenly shorting a circuit, etc.)

VEHICLE IDENTIFICATION

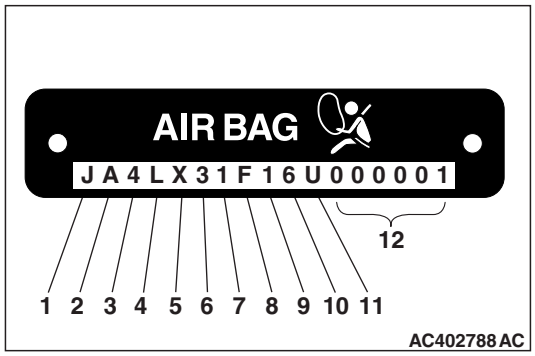
VEHICLE IDENTIFICATION

M1001000401200

VEHICLES IDENTIFICATION NUMBER LOCATION



The vehicle identification number (VIN) is located on a plate attached to the left top side of the instrument panel.



VEHICLE IDENTIFICATION CODE CHART PLATE

All vehicle identification numbers contain 17 digits. The vehicle number is a code which tells country, make, vehicle type, etc.

NO.	ITEM	CONTENT
1	Country	J: Japan
2	Make	A: Mitsubishi
3	Vehicle type	4: Multi-purpose vehicle
4	Others	GROSS VEHICLE WEIGHT RATING/BRAKE SYSTEM L; 4001-5000 lbs/HYDRAULIC
5	Line	X: OUTLANDER FWD
		Z: OUTLANDER AWD
6	Price class	3: Medium
		4: High
		8: Sports
7	Body	1: 5-door wagon
8	Engine	F: 2.4L (4G69)
9	Check digits*	0, 1, 2, 3, ----------9, X
10	Model year	6: 2006 year
11	Plant	U: Mizushima
12	Serial number	000001 to 999999

*NOTE: *: Check digit means a single number, or letter X, used to verify the accuracy of transcription of vehicle identification number.*

VEHICLE IDENTIFICATION NUMBER LIST

VEHICLES FOR USA

VIN (EXCEPT SEQUENCE NUMBER)	BRAND	ENGINE DISPLACEMENT	MODEL CODE
JA4LX31F_6U	MITSUBISHI OUTLANDER	2.4L	CU5WXNMYL2M
JA4LX31F_6U			CU5WXRMYL2M
JA4LX31F_6U			CU5WXRMYL7M
JA4LX41F_6U			CU5WXRHYL2M
JA4LX41F_6U			CU5WXRHYL7M
JA4LX81F_6U			CU5WXRXYL2M
JA4LX81F_6U			CU5WXRXYL7M
JA4LZ31F_6U			CU5WXNMYZL2M
JA4LZ31F_6U			CU5WXRMYZL2M
JA4LZ41F_6U			CU5WXRHYZL2M
JA4LZ81F_6U			CU5WXRXYZL2M

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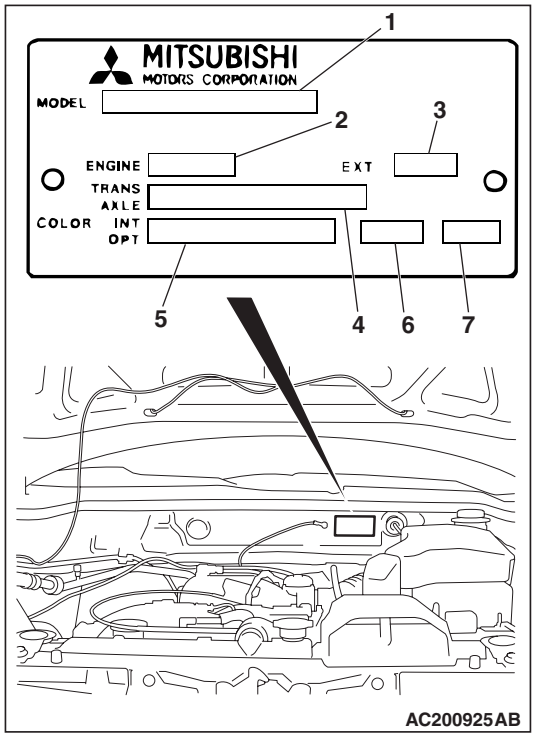
VEHICLES FOR CANADA

VIN (EXCEPT SEQUENCE NUMBER)	BRAND	ENGINE DISPLACEMENT	MODEL CODE
JA4LX31F_6U	MITSUBISHI OUTLANDER	2.4L	CU5WXNMYL3M
JA4LX31F_6U			CU5WXRMYL3M
JA4LZ31F_6U			CU5WXNMYZL3M
JA4LZ31F_6U			CU5WXRMYZL3M
JA4LZ41F_6U			CU5WXRHYZL3M
JA4LZ41F_6U			CU5WXRXYZL3M



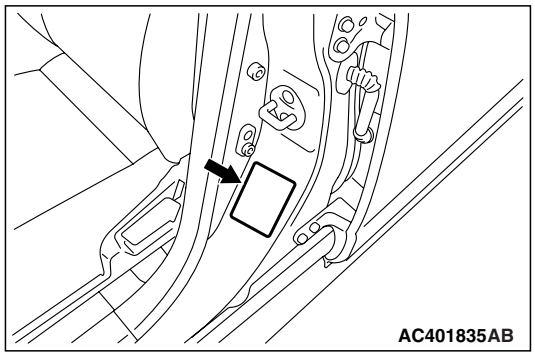
VEHICLE IDENTIFICATION CODE PLATE

M1001005400752

The vehicle information code plate is riveted onto the cowl top outer panel in the engine compartment.
The plate shows model code, engine model, transaxle model and body color code.

NO.	ITEM	CONTENT	
1	MODEL	CU5WXRMYL2M	CU5WX: Vehicle model
			RMYL2M: Model series
2	ENGINE	4G69	Engine model
3	EXT	G44B	Exterior code
4	TRANS AXLE	F4A4B	Transaxle model
5	COLOR	G44	Body color code
6	INT	11E	Interior code
7	OPT	Z06	Equipment code

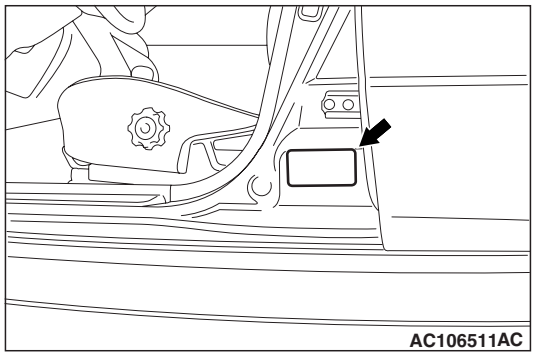
For monotone color vehicles, the body color code shall be indicated.



TIRE AND LOADING INFORMATION PLACARD

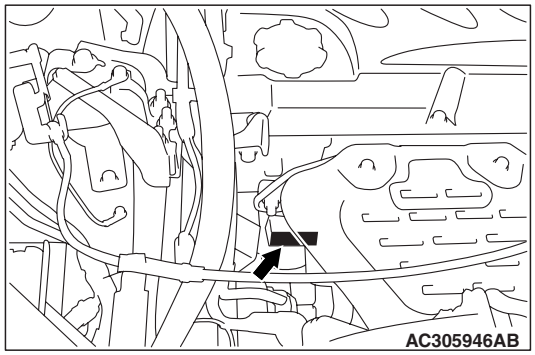
The tire and loading information placard is located on the inside sill of the driver's door.

VEHICLE SAFETY CERTIFICATION LABEL


AC106511AC

The vehicle safety certification label is attached to the face of the left door sill.
This label indicates the month and year of manufacture, Gross Vehicle Weight Rating (GVWR), front and rear Gross Axle Weight Rating (GAWR), and Vehicle Identification Number (VIN).

ENGINE MODEL STAMPING

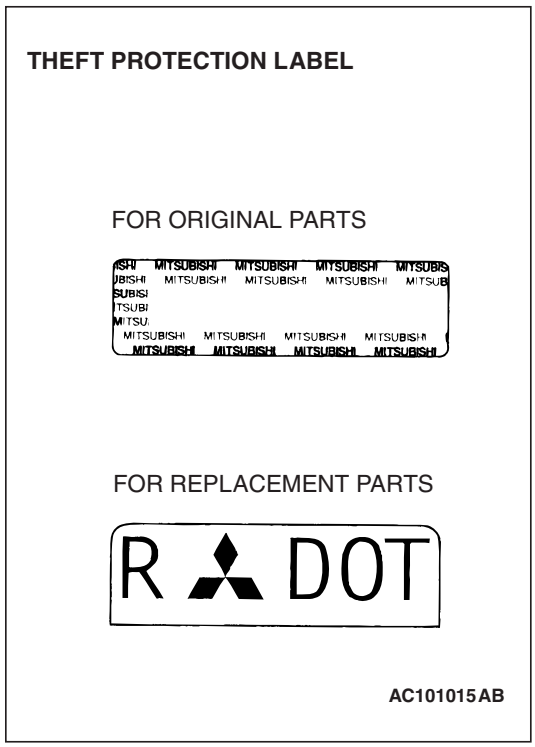

AC305946AB

The engine model is stamped on the cylinder block.
These engine model numbers are as shown as follows.

ENGINE MODEL	ENGINE DISPLACEMENT
4G69	2.4L

The engine serial number is stamped near the engine model number.

THEFT PROTECTION



In order to protect against theft, a Vehicle Identification Number (VIN) is attached as a plate or label to the following major parts of the engine and transaxle, as well as main outer panels:
Engine cylinder block, Transaxle housing, Fender, Doors, liftgate, Quarter panel, Hood, Bumpers
In addition, a theft-protection label is attached to replacement parts for the body outer panel main components, and the same data is stamped into replacement parts for the engine and the transaxle.

⚠ CAUTION

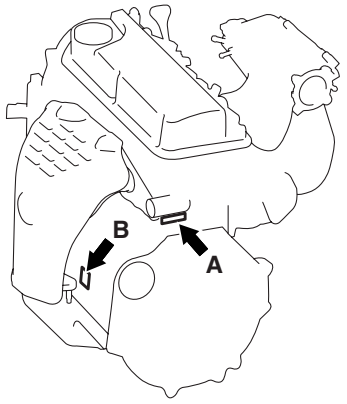
Cautions regarding panel repairs:

- **When repainting original parts, do so after first masking the theft-protection label. After painting, be sure to peel off the masking tape.**
- **The theft-protection label for replacement parts is covered by masking tape, so such parts can be painted as is. The masking tape should be removed after painting is finished.**
- **The theft-protection label should not be removed from original parts or replacement parts.**

LOCATIONS

LABEL AREA (A: FOR ORIGINAL EQUIPMENT PARTS, B: FOR REPLACEMENT PARTS)

ENGINE



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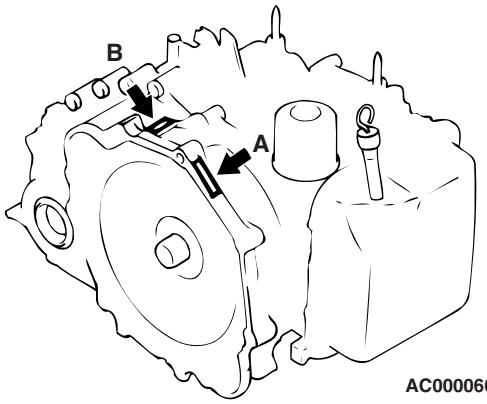
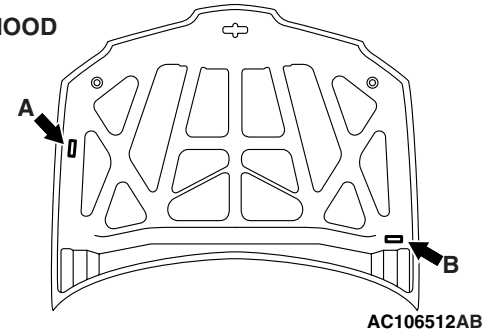
AUTOMATIC TRANSAXLE



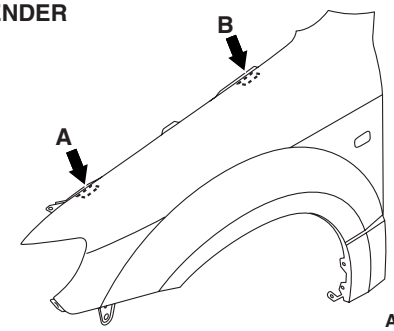
AC000060AB

HOOD



AC106512AB

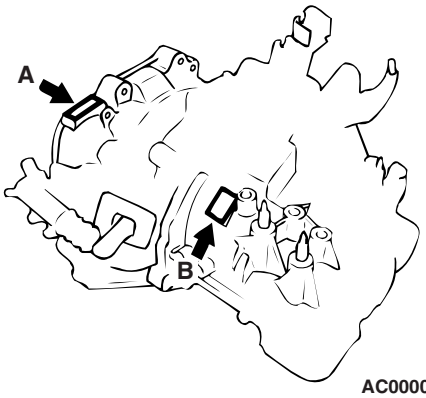
FENDER



AC200865AB

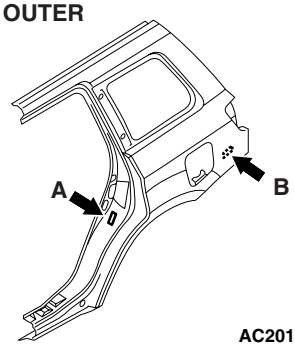
THE ILLUSTRATION INDICATES LEFT OUTER SIDE.
RIGHT SIDE IS SYMMETRICALLY OPPOSITE.

MANUAL TRANSAXLE



AC000059AC

QUARTER PANEL OUTER



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THE ILLUSTRATION INDICATES LEFT OUTER SIDE.
RIGHT SIDE IS SYMMETRICALLY OPPOSITE.

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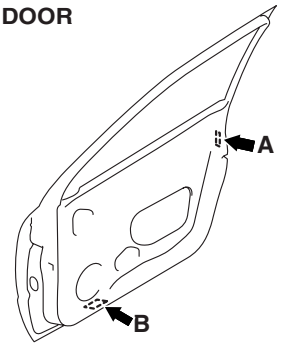
LABEL AREA (A: FOR ORIGINAL EQUIPMENT PARTS, B: FOR REPLACEMENT PARTS)

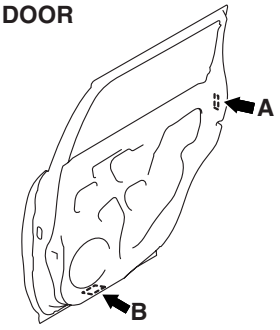
FRONT DOOR



THE ILLUSTRATION INDICATES RIGHT INNER SIDE.
LEFT SIDE IS SYMMETRICALLY OPPOSITE.

AC200858AB

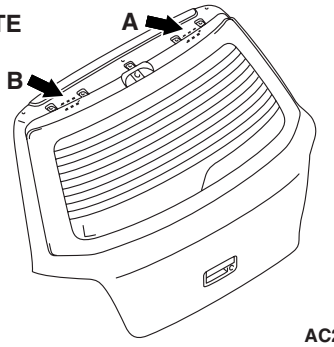
REAR DOOR



THE ILLUSTRATION INDICATES RIGHT INNER SIDE.
LEFT SIDE IS SYMMETRICALLY OPPOSITE.

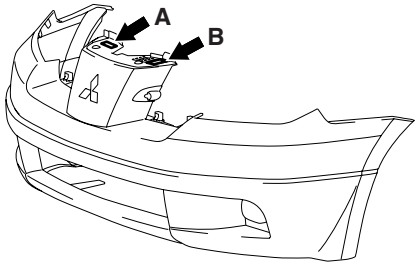
AC200859AB

LIFTGATE



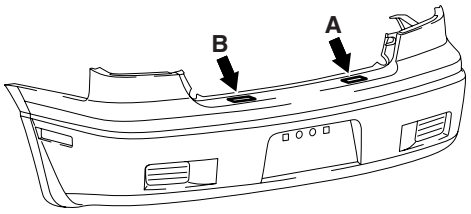
AC200871AB

FRONT BUMPER



AC201550AB

REAR BUMPER



AC201551AB

PRECAUTIONS BEFORE SERVICE

SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

M1001011600249

1. Items to review when servicing SRS:
   (1) Be sure to read GROUP 52B, Supplemental Restraint System (SRS). For safe operation, please follow the directions and heed all warnings.
   (2) Wait at least 60 seconds after disconnecting the battery cable before doing any further work. The SRS system is designed to retain enough voltage to deploy the air bag even after the battery has been disconnected. Serious injury may result from unintended air bag deployment if work is done on the SRS system immediately after the battery cable is disconnected.
   (3) Warning labels must be heeded when servicing or handling SRS components. Warning labels can be found in the following locations.
   - Front impact sensor
   - Hood
   - Sun visor
   - SRS-ECU
   - Steering wheel
   - Clock spring
   - Steering joint cover
   - Air bag module (Driver's or front passenger's)
   - Side-air bag module (Driver's side or front passenger's side)
   - Side impact sensor
   - Seat belt pre-tensioner

   (4) Always use the designated special tools and test equipment.
   (5) Store components removed from the SRS in a clean and dry place. The air bag module should be stored on a flat surface and placed so that the pad surface is facing upward.
   (6) Never attempt to disassemble or repair the SRS components (SRS-ECU, air bag module and clock spring). If there is a defect, replace the defective part.
   (7) Whenever you finish servicing the SRS, check the SRS warning light operation to make sure that the system functions properly.
   (8) Be sure to deploy the air bag before disposing of the air bag module or disposing of a vehicle equipped with an air bag (Refer to GROUP 52B P.52B-376, Air Bag Module Disposal Procedures).
2. Observe the following when carrying out operations on places where SRS components are installed, including operations not directly related to the SRS air bag.
   (1) When removing or installing parts, do not allow any impact or shock to occur to the SRS components.
   (2) If heat damage may occur during paint work, remove the SRS-ECU, the air bag module, clock spring, the front impact sensor, the side impact sensor, and the seat belt pre-tensioner.
   - SRS-ECU, air bag module, clock spring, front impact sensor, the side impact sensor: 93 °C (200 °F) or more
   - Seat belt pre-tensioner: 90 °C (194 °F) or more

HOW TO PERFORM VEHICLE IDENTIFICATION NUMBER (VIN) WRITING

M1001011400223

The Vehicle Identification Number (VIN) is stored in the ECM <M/T> or the PCM <A/T> by the vehicle manufacture. If the VIN to be stored in the ECM <M/T> or the PCM <A/T> is eliminated fraudulently, the Malfunction Indicator Lamp (SERVICE ENGINE SOON or Check Engine Lamp) illuminates and Diagnostic Trouble Code (DTC) No. P0630 (VIN malfunction) is shown. When the ECM <M/T> or the PCM <A/T> is replaced, and entry of the VIN necessary due to DTC No. P0630 (VIN malfunction). Enter the VIN in accordance with the procedure as follows:

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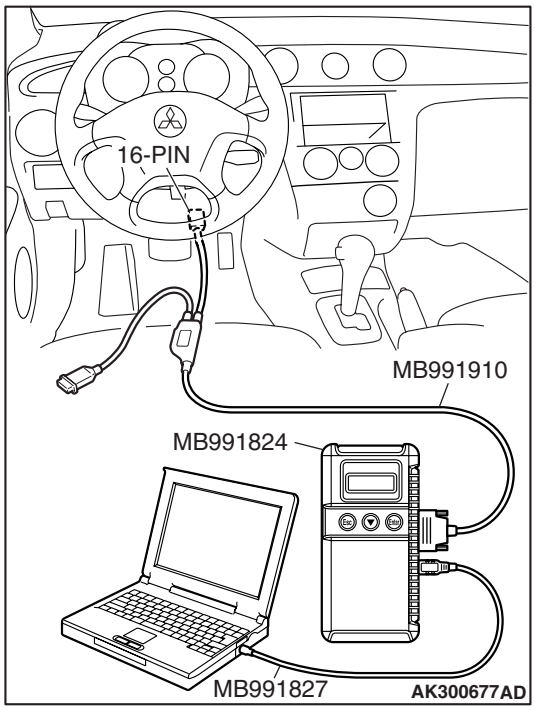
WRITING PROCEDURE

Required Special Tools:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: MUT-III USB Cable
  - MB991910: MUT-III Main Harness A



⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

1. Connect scan tool MB991958 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Confirm DTC No. P0603 (EEPROM malfunction) is not shown.

   NOTE: When DTC No. P0603 (EEPROM malfunction) is shown, the VIN cannot be stored even if entered. Therefore, the troubleshooting is performed when this DTC is shown.
4. Select "Coding" form the menu screen.
5. Select "VIN writing" form the menu screen.
6. Enter the VIN.
7. After entry of the VIN, turn the ignition switch to the "LOCK" (OFF) position. After ten seconds or more passed, turn to the "ON" position again.
8. Confirm DTC No. P0630 (VIN malfunction) is not shown.

   NOTE: When DTC No. P0630 (VIN malfunction) is shown, enter the VIN again because that would be not appropriate.

INITIALIZATION PROCEDURE FOR LEARNING VALUE IN MFI ENGINE

M1001011700280

When the following service is performed, initialize the learning value.

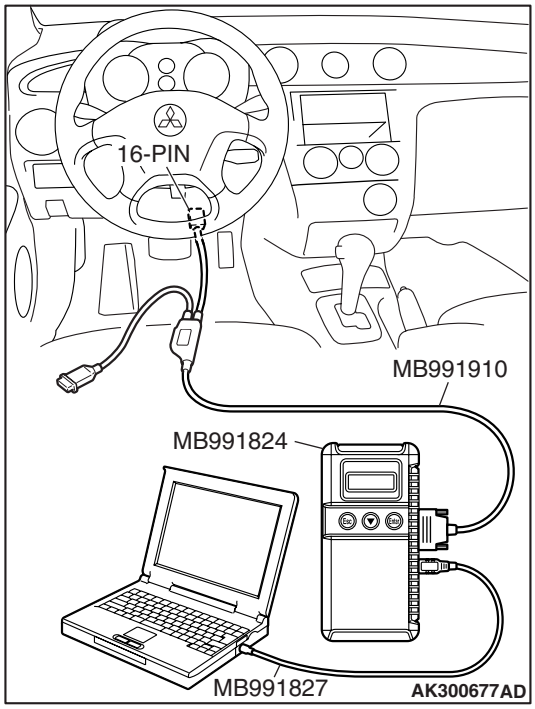
- At replacing engine assembly*
- At replacing throttle body and at cleaning
- At replacing knock sensor

*NOTE: * Initialize A/T-related learning value.*

INITIALIZATION PROCEDURE

Required Special Tools:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: MUT-III USB Cable
  - MB991910: MUT-III Main Harness A



⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

1. Connect scan tool MB991958 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Select "Check Mode" form the menu screen.
4. Select "ERASE MEMORY" form the menu screen.
5. Initialize the learning value.
6. After initialization of the learning value, learn the idling in MFI engine. (Refer to LEARNING PROCEDURE FOR IDLING IN MFI ENGINE).

LEARNING PROCEDURE FOR IDLING IN MFI ENGINE

M1001011800306

PURPOSE

When the ECM <M/T> or the PCM <A/T> is replaced, or when the learning value is initialized, the idling is not stabilized because the learning value in MFI engine is not completed. In this case, carry out the learning method for the idling through the following procedures.

LEARNING PROCEDURE

1. Start the engine and carry out the warm-up for the engine coolant temperature to reach 80° C (176° F) or more.

   NOTE: When the engine coolant temperature is 80 °C (176 °F) or more, the warm-up is not needed if the ignition switch is in "ON" position once.
2. Place the ignition switch in "LOCK" (OFF) position and stop the engine.
3. After 10 seconds or more, start the engine again.
4. For 10 minutes, carry out the idling under the condition shown below and then confirm the engine has the normal idling.
   - Transaxle: Neutral (P range on vehicles with A/T)
   - Operation in ignition-related, fan and attachments: Not to be operated
   - Engine coolant temperature: 80° C (176° F) or more

   NOTE: When the engine stalls during the idling, check the dirtiness (on the throttle valve) of the throttle body and then perform the service from Procedure 1 again.

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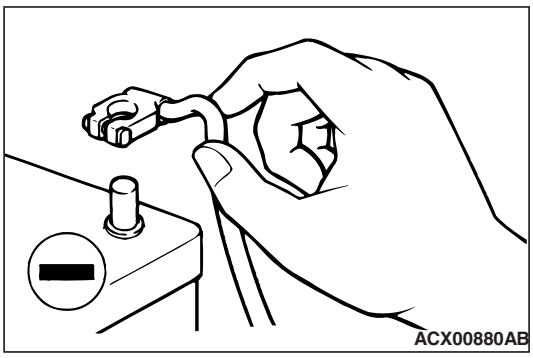
SERVICING ELECTRICAL SYSTEM

M1001011900132

⚠ *WARNING*

Battery posts, terminals and related accessories contain lead and lead compounds. WASH HANDS AFTER HANDLING.



1. Note the following before proceeding with working on the electrical system.
   Never perform unauthorized modifications to any electrical device or wiring. Such modifications might lead to a vehicle malfunction, over-capacity or short-circuit that could result in a fire in the vehicle.

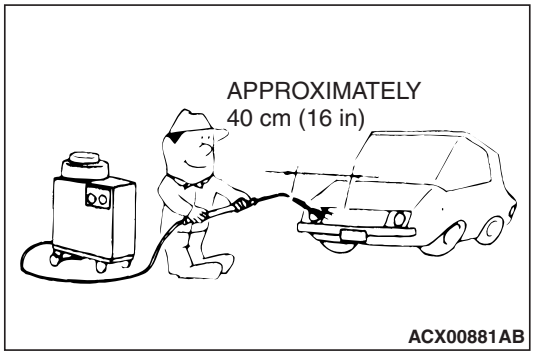
⚠ **CAUTION**

- **Before connecting or disconnecting the negative battery cable, be sure to turn the ignition switch to the "LOCK" (OFF) position and turn off the lights (If this is not done, there is the possibility of semiconductor parts being damaged).**
- **After completion of the work (and the negative battery terminals is connected), warm up the engine and allow it to idle for approximately 10 minutes under the conditions described below in order to stabilize engine control conditions, and then check to be sure that the idle is satisfactory.**
  - **Engine coolant temperature: 85 –95° C (185 –203° F)**
  - **Lights and all accessories: OFF**
  - **Transaxle: "N" or "P" position**
  - **Steering wheel: straight-forward position**

2. When servicing the electrical system, disconnect the negative cable terminal from the battery.

VEHICLE WASHING

M1001012000121



If high-pressure car-washing equipment or steam car-washing equipment is used to wash the vehicle, be sure to maintain the spray nozzle at a distance of at least approximately 40cm (16 inches) from any plastic parts and all opening parts (doors, luggage compartment, etc.).

APPLICATION OF ANTI-CORROSION AGENTS AND UNDERCOATS

M1001011000117

Be careful not to apply oil or grease to the heated oxygen sensor. If applied, the sensor may malfunction. Protect the heated oxygen sensor with a cover before applying anti-corrosion agent, etc.

SCAN TOOL (MULTI USE TESTER {MUT-III} SUB ASSEMBLY)

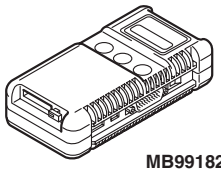
M1001012200277

⚠ CAUTION

Turn the ignition switch to the "LOCK" (OFF) position before disconnecting or connecting the scan tool.

NOTE: MUT-III trigger harness is not necessary when pushing V.C.I. ENTER key.

VEHICLE COMMUNICATION INTERFACE (V.C.I.)



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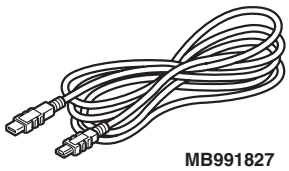
MUT-III USB CABLE



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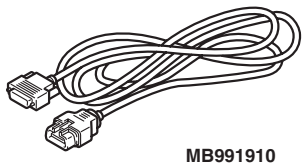
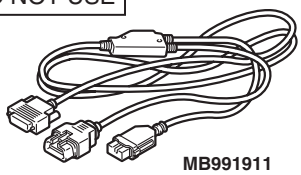
MUT-III MAIN HARNESS A



MB991910

MUT-III MAIN HARNESS B

DO NOT USE



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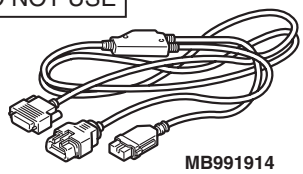
MUT-III MAIN HARNESS C

DO NOT USE



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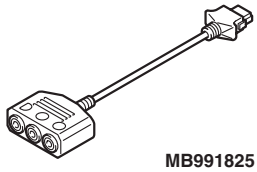
MUT-III MEASUREMENT ADAPTER



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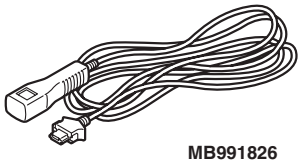
MUT-III TRIGGER HARNESS



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TOWING AND HOISTING

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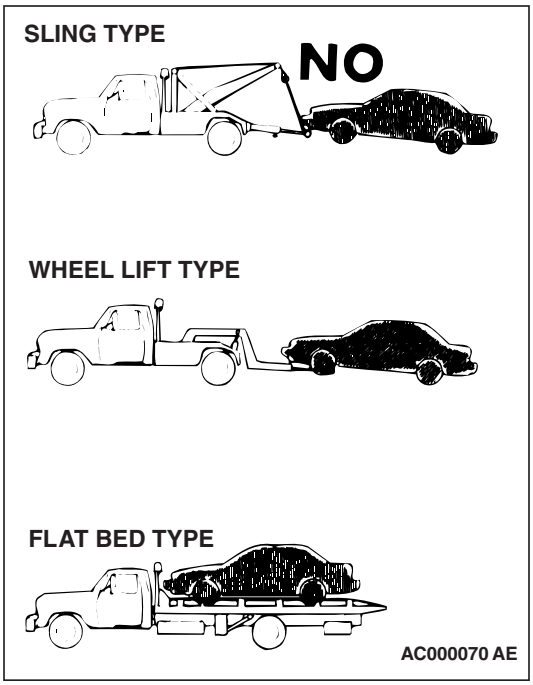
WRECKER TOWING RECOMMENDATION

FRONT TOWING PICKUP <FWD>

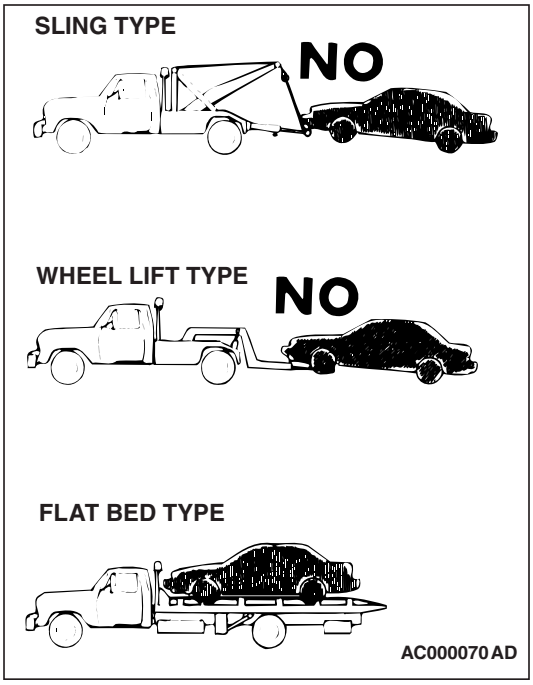


⚠ CAUTION

This vehicle cannot be towed by a wrecker using sling-type equipment; otherwise the bumper may become deformed. If this vehicle is towed, use wheel lift or flat bed equipment.

The vehicle may be towed on its rear wheels for extended distances provided the parking brake is released. It is recommended that vehicles be towed using the front pickup whenever possible.

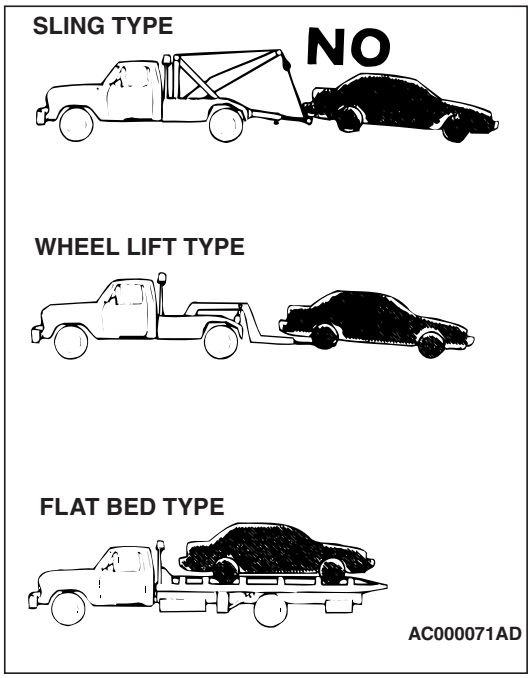
FRONT TOWING PICKUP <AWD>



⚠ CAUTION

- **If only the front wheels or only the rear wheels are lifted for towing, the bumper will be damaged.**
  In addition, lifting of the rear wheels causes the oil to flow forward, and may result in heat damage to the rear bushing of the transfer, and so should never be done.
- **The vehicle must not be towed by placing only its front wheels or only the rear wheels on a rolling dolly, because to do so will result in deterioration of the viscous coupling and in the viscous coupling causing the vehicle to jump forward suddenly.**

If this vehicle is towed, use flat bed equipment



REAR TOWING PICKUP <FWD>

⚠ CAUTION

- **This vehicle cannot be towed by a wrecker using sling-type equipment; otherwise the lower arm may become deformed. If this vehicle is towed, use a wheel lift or flat bed equipment.**
- **Do not use the steering column lock to secure the front wheels for towing.**
- **Make sure the transaxle is in Neutral if vehicle will have drive wheels on the ground.**
- **If these requirements cannot be met, the front wheels must be placed on a tow dolly.**

Automatic transmission vehicle may be towed on the front wheels at speeds not to exceed 50 km/h (30 mph) for distances not to exceed 30 km (18 miles).

TOWING WHEN KEYS ARE NOT AVAILABLE

When a locked vehicle must be towed and keys are not available, the vehicle may be lifted and towed from the front, provided the parking brake is released. If not released, the rear wheels should be placed on a tow dolly.

SAFETY PRECAUTIONS

The following precautions should be taken when towing the vehicle:

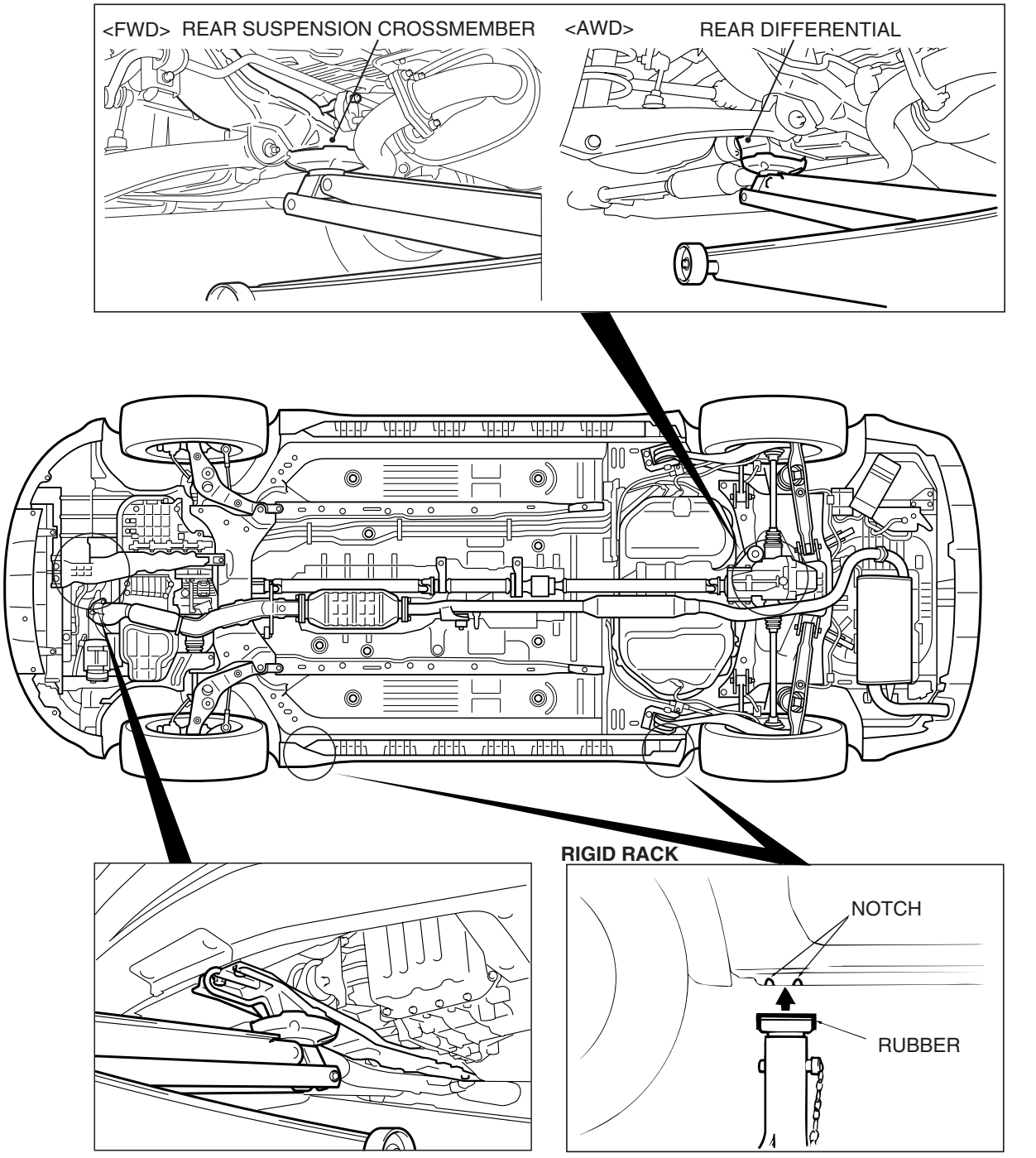
1. DO NOT LIFT OR TOW THE VEHICLE BY ATTACHING TO OR WRAPPING AROUND THE BUMPER.
2. Any loose, protruding, or damaged parts such as hoods, doors, fenders, trim, etc. should be secured or removed prior to moving the vehicle.
3. Refrain from going under a vehicle when it is lifted by the towing equipment, unless the vehicle is adequately supported by safety stands.
4. Never allow passengers to ride in a towed vehicle.
5. State and local rules and regulations must be followed when towing a vehicle.

LIFTING, JACKING SUPPORT LOCATION

FLOOR JACK

⚠ CAUTION

- **Never support any point other than the specified one, or that point will be deformed.**
- **For lifting, put rubber or similar material between the side sill and rigid rack, or the side sill area will be damaged.**



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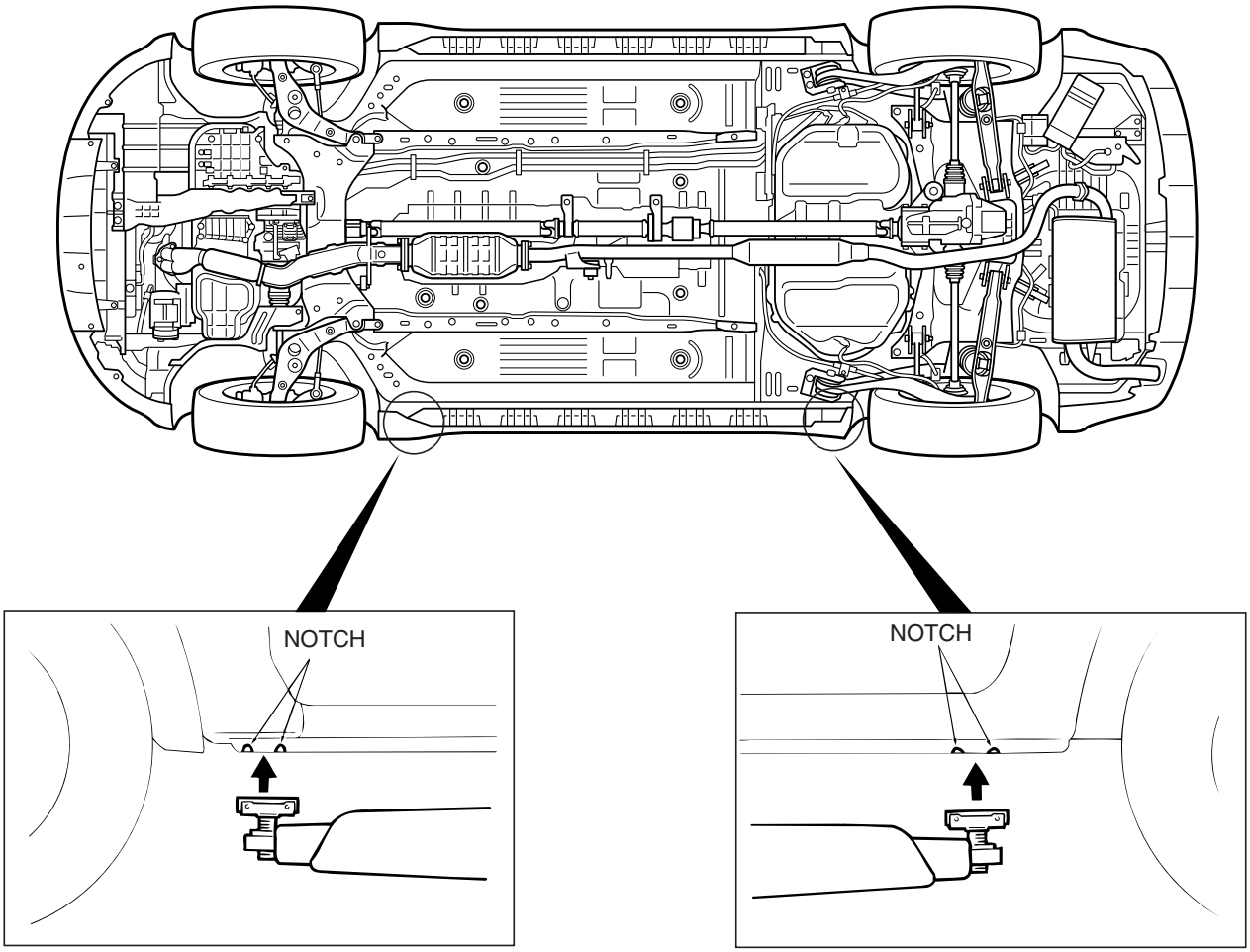
POST TYPE

Special care should be taken when raising the vehicle on a frame contact type hoist. The hoist must be equipped with the proper adapters in order to support the vehicle at the proper locations.

⚠ CAUTION

When service procedures require removing rear suspension, fuel tank and spare tire, place additional weight on the rear end of vehicle, or anchor vehicle to hoist to prevent tipping when the location of the center of gravity changes.



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GENERAL DATA AND SPECIFICATIONS

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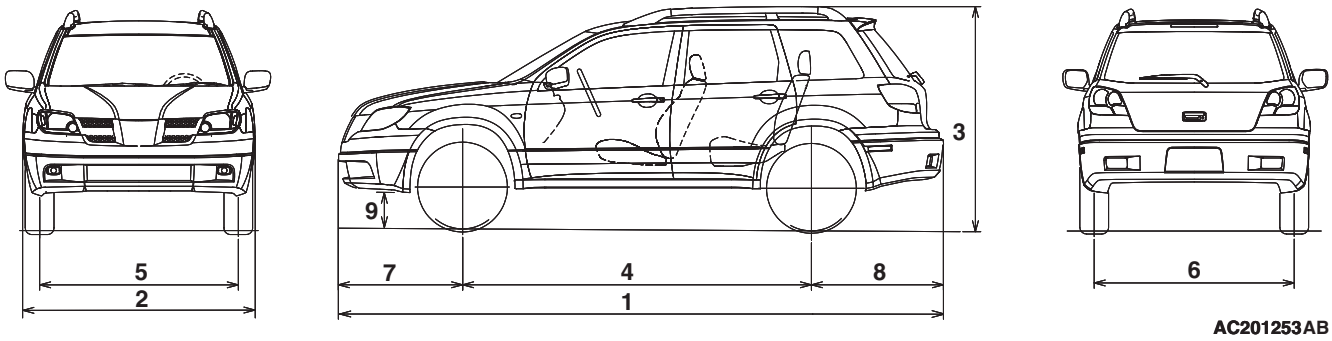

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GENERAL SPECIFICATIONS

<A/T>

ITEM			LS-FWD MODEL	XLS-FWD MODEL	LIMITED-FWD MODEL	LS-AWD MODEL	XLS-AWD MODEL	LIMITED-AWD MODEL
Vehicle dimension mm (in)	Overall length	1	4,550 (179.1)	4,550 (179.1)	4,550 (179.1)	4,550 (179.1)	4,550 (179.1)	4,550 (179.1)
	Overall width	2	1,750 (68.9)	1,780 (70.1)	1,780 (70.1)	1,750 (68.9)	1,780 (70.1)	1,780 (70.1)
	Overall height (unladen)	3	1,635 (64.4) <Vehicles without roof rail> 1,685 (66.3) <Vehicles with roof rail>	1,685 (66.3)	1,685 (66.3)	1,635 (64.4) <Vehicles without roof rail> 1,685 (66.3) <Vehicles with roof rail>	1,685 (66.3)	1,685 (66.3)
	Wheelbase	4	2,625 (103.3)	2,625 (103.3)	2,625 (103.3)	2,625 (103.3)	2,625 (103.3)	2,625 (103.3)
	Tread-front	5	1,495 (58.9)	1,510 (59.4)	1,510 (59.4)	1,495 (58.9)	1,510 (59.4)	1,510 (59.4)
	Tread-rear	6	1,505 (59.3)	1,520 (59.8)	1,520 (59.8)	1,505 (59.3)	1,520 (59.8)	1,520 (59.8)
	Overhang-front	7	935 (36.8)	935 (36.8)	935 (36.8)	935 (36.8)	935 (36.8)	935 (36.8)
	Overhang-rear	8	990 (39.0)	990 (39.0)	990 (39.0)	990 (39.0)	990 (39.0)	990 (39.0)
	Ground clearance	9	210 (8.3)	210 (8.3)	210 (8.3)	210 (8.3)	210 (8.3)	210 (8.3)
Vehicle weight kg (lb)	Curb weight		1,490 (3,284)	1,510 (3,329)	1,510 (3,329)	1,595 (3,515)	1,615 (3,559)	1,615 (3,559)
	Gross vehicle weight rating		1,910 (4,211)	1,910 (4,211)	1,910 (4,211)	2,010 (4,431)	2,010 (4,431)	2,010 (4,431)

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ITEM		LS-FWD MODEL	XLS-FWD MODEL	LIMITED-FWD MODEL	LS-AWD MODEL	XLS-AWD MODEL	LIMITED-AWD MODEL
	Gross axle weight rating-front	1,070 (2,359)	1,070 (2,359)	1,070 (2,359)	1,070 (2,359)	1,070 (2,359)	1,070 (2,359)
	Gross axle weight rating-rear	1,075 (2,370)	1,075 (2,370)	1,075 (2,370)	1,075 (2,370)	1,075 (2,370)	1,075 (2,370)
Seating capacity		5					
Engine	Model No.	4G69					
	Piston displacement	2.4L					
Transaxle	Model No.	F4A4B	F4A4B	F4A4B	W4A4B	W4A4B	W4A4B
	Type	4-speed automatic					
Fuel system	Fuel supply system	Electronic controlled multiport fuel injection					

<M/T>

ITEM			LS-FWD MODEL	LS-AWD MODEL
Vehicle dimension mm (in)	Overall length	1	4,550 (179.1)	4,550 (179.1)
	Overall width	2	1,750 (68.9)	1,780 (70.1)
	Overall height (unladen)	3	1,635 (64.4) <Vehicles without roof rail> 1,685 (66.3) <Vehicles with roof rail>	1,685 (66.3)
	Wheelbase	4	2,625 (103.3)	2,625 (103.3)
	Tread-front	5	1,495 (58.9)	1,510 (59.4)
	Tread-rear	6	1,505 (59.3)	1,520 (59.8)
	Overhang-front	7	935 (36.8)	935 (36.8)
	Overhang-rear	8	990 (39.0)	990 (39.0)
	Ground clearance	9	210 (8.3)	210 (8.3)
Vehicle weight kg (lb)	Curb weight		1,470 (3,284)	1,575 (3,471)
	Gross vehicle weight rating		1,910 (4,211)	2,010 (4,431)
	Gross axle weight rating-front		1,070 (2,359)	1,070 (2,359)
	Gross axle weight rating-rear		1,075 (2,370)	1,075 (2,370)
Seating capacity			5	
Engine	Model No.		4G69	

ITEM		LS-FWD MODEL	LS-AWD MODEL
	Piston displacement	2.4L	
Transaxle	Model No.	F5M42	W5M42
	Type	5-speed manual	
Fuel system	Fuel supply system	Electronic controlled multiport fuel injection	

TIGHTENING TORQUE

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Each torque value in the table is a standard value for tightening under the following conditions.

1. Bolts, nuts and washers are all made of steel and plated with zinc.
2. The threads and bearing surface of bolts and nuts are all in dry condition.

The values in the table are not applicable:

1. If toothed washers are inserted.
2. If plastic parts are fastened.
3. If bolts are tightened to plastic or die-cast inserted nuts.
4. If self-tapping screws or self-locking nuts are used.

STANDARD BOLT AND NUT TIGHTENING TORQUE

THREAD SIZE		STANDARD TIGHTENING TORQUE		
NOMINAL BOLT DIAMETER (mm)	PITCH (mm)	HEAD MARK "4"	HEAD MARK "7"	HEAD MARK "8"
M5	0.8	2.5 ±0.5 N· m (23 ±4 in-lb)	5.0 ±1.0 N· m (44 ±9 in-lb)	6.0 ±1.0 N· m (53 ±9 in-lb)
M6	1.0	5.0 ±1.0 N· m (44 ±9 in-lb)	8.5 ±1.5 N· m (76 ±13 in-lb)	10 ±2 N· m (89 ±17 in-lb)
M8	1.25	11 ±2 N· m (98 ±17 in-lb)	20 ±4 N· m (15 ±3 ft-lb)	24 ±4 N· m (18 ±3 ft-lb)
M10	1.25	23 ±4 N· m (17 ±3 ft-lb)	42 ±8 N· m (31 ±6 ft-lb)	53 ±7 N· m (39 ±5 ft-lb)
M12	1.25	42 ±8 N· m (31 ±6 ft-lb)	80 ±10 N· m (59 ±7 ft-lb)	93 ±12 N· m (68 ±9 ft-lb)
M14	1.5	70 ±10 N· m (52 ±7 ft-lb)	130 ±20 N· m (96 ±15 ft-lb)	150 ±20 N· m (111 ±14 ft-lb)
M16	1.5	105 ±15 N· m (78 ±11 ft-lb)	195 ±25 N· m (144 ±18 ft-lb)	230 ±30 N· m (170 ±22 ft-lb)
M18	1.5	150 ±20 N· m (111 ±14 ft-lb)	290 ±40 N· m (214 ±29 ft-lb)	335 ±45 N· m (247 ±33 ft-lb)
M20	1.5	210 ±30 N· m (155 ±22 ft-lb)	400 ±60 N· m (295 ±44 ft-lb)	465 ±65 N· m (343 ±48 ft-lb)
M22	1.5	290 ±40 N· m (214 ±29 ft-lb)	540 ±80 N· m (398 ±59 ft-lb)	630 ±90 N· m (465 ±66 ft-lb)
M24	1.5	375 ±55 N· m (277 ±40 ft-lb)	705 ±105 N· m (520 ± 77 ft-lb)	820 ±120 N· m (605 ± 88 ft-lb)

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FLANGE BOLT AND NUT TIGHTENING TORQUE

THREAD SIZE		STANDARD TIGHTENING TORQUE		
NOMINAL BOLT DIAMETER (mm)	PITCH (mm)	HEAD MARK "4"	HEAD MARK "7"	HEAD MARK "8"
M6	1.0	5.0 ±1.0 N· m (44 ±9 in-lb)	10 ±2 N· m (89 ±17 in-lb)	12 ±2 N· m (107 ±17 in-lb)
M8	1.25	13 ±2 N· m (111 ±22 in-lb)	24 ±4 N· m (18 ±3 ft-lb)	28 ±5 N· m (20 ±4 ft-lb)
M10	1.25	26 ±5 N· m (19 ±4 ft-lb)	50 ±5 N· m (37 ±4 ft-lb)	58 ±7 N· m (43 ±5 ft-lb)
M10	1.5	25 ±4 N· m (18 ±3 ft-lb)	46 ±8 N· m (34 ±6 ft-lb)	55 ±5 N· m (41 ±3 ft-lb)
M12	1.25	47 ±9 N· m (35 ±6 ft-lb)	93 ±12 N· m (68 ±9 ft-lb)	105 ±15 N· m (78 ±11 ft-lb)
M12	1.75	43 ±8 N· m (32 ±6 ft-lb)	83 ±12 N· m (61 ±9 ft-lb)	98 ±12 N· m (72 ±9 ft-lb)

LUBRICATION AND MAINTENANCE

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Maintenance and lubrication service recommendations have been compiled to provide maximum protection for the vehicle owner's investment against all reasonable types of driving conditions. Since these conditions vary with the individual vehicle owner's driving habits, the area in which the vehicle is operated and the type of driving to which the vehicle is subjected, it is necessary to prescribe lubrication and maintenance service on a time frequency as well as mileage interval basis.
Oils, lubricants and greases are classified and graded according to standards recommended by the Society of Automotive Engineers (SAE), the American Petroleum Institute (API) and the National Lubricating Grease Institute (NLGI).

MAINTENANCE SCHEDULES

Information for service maintenance is provided in the "SCHEDULED MAINTENANCE TABLE." Three schedules are provided; one for "Required Maintenance." one for "General Maintenance" and one for "Severe Usage Service."
The item numbers in "SCHEDULED MAINTENANCE TABLE" correspond to the section numbers in "MAINTENANCE SERVICE."

SEVERE SERVICE

Vehicles operating under severe service conditions will require more frequent service.
Component service information is included for vehicles operating under one or more of the following conditions:

1. Trailer towing or police, taxi or commercial type operation.
2. Operation of Vehicle
   (1) Short-trip operation at freezing temperature (engine not thoroughly warmed up)
   (2) More than 50% operation in heavy city traffic during hot weather above 32° C (90° F)
   (3) Extensive idling
   (4) Driving in sandy areas
   (5) Driving in salty areas
   (6) Driving in dusty conditions
   (7) Driving off-road

ENGINE OIL

⚠ CAUTION

Test results submitted to EPA have shown that laboratory animals develop skin cancer after prolonged contact with used engine oil. Accordingly, the potential exists for humans to develop a number of skin disorders, including cancer, from such exposure to used engine oil. Therefore, when changing engine oil, be careful not to touch it as much as possible. Protective clothing and gloves, that cannot be penetrated by oil, should be worn. The skin should be thoroughly washed with soap and water, or use waterless hand cleaner, to remove any used engine oil. Do not use gasoline, thinners, or solvents.

Either of the following engine oils should be used:
Engine oils displaying ILSAC certification symbol or conforming to the API classification SL, SL/CF.

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For further details, refer to "LUBRICANTS SELECTION."

LUBRICANTS AND GREASES

Semi-solid lubricants bear the NLGI designation and are further classified as grades 0, 1, 2, 3, etc. Whenever "Chassis Lubricant" is specified, Multipurpose Grease, NLGI grade Number 2, should be used.

FUEL USAGE STATEMENT

⚠ CAUTION

Using leaded gasoline in this car will damage the catalytic converters and heated oxygen sensors, and affect the warranty coverage validity.

This vehicle must use unleaded gasoline only.

This vehicle has a fuel filler tube which is especially designed to accept only the smaller-diameter unleaded gasoline dispensing nozzle.

The 2.4L model is designed to operate on unleaded gasoline having a minimum octane rating of 87 [(MON + RON)/2], or 91 RON.

NOTE:

- *MON: Motor Octane Number*
- *RON: Research Octane Number*

GASOLINE CONTAINING ALCOHOL

Some gasoline sold at service stations contain alcohol although they may not be so identified.

Using fuels containing alcohol is not recommended unless the nature of the blend can be determined as being satisfactory.

Gasohol: A mixture of 10% ethanol (grain alcohol) and 90% unleaded gasoline may be used in your vehicle. If driveability problems are experienced as a result of using gasohol, it is recommended that the vehicle be operated on gasoline.

Methanol: **Do not use gasoline containing methanol (wood alcohol).** Using this type of alcohol can result in vehicle performance deterioration and damage critical parts in the fuel system components. Fuel system damage and performance problems resulting from the use of gasoline containing methanol may not be covered by the new vehicle warranty.

GASOLINE CONTAINING METHYL TERTIARY BUTYL ETHER (MTBE)

Unleaded gasoline containing 15% or less MTBE may be used in your vehicle. (Fuel containing MTBE over 15% in volume may cause reduced engine performance and produce vapor lock or hard starting.

MATERIALS ADDED TO FUEL

Indiscriminate use of fuel system cleaning agents should be avoided. Many of these materials intended for gum and varnish removal may contain highly active solvents or similar ingredients that can be harmful to gasket and diaphragm materials used in fuel system component parts.

RECOMMENDED LUBRICANTS AND LUBRICANT CAPACITIES TABLE

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RECOMMENDED LUBRICANTS

LUBRICANT	SPECIFICATIONS	REMARKS
Engine oil	Engine oils displaying ILSAC certification symbol or conforming to the API classification SL, SL/CF	For further details, refer to "LUBRICANTS SELECTION" section.
Transmission oil <M/T>	DiaQueen NEW MULTI GEAR OIL API classification GL-3 SAE 75W-80 or Gear oil API classification GL-4 SAE 75W-85W or 75W-90	-
Transmission fluid <A/T>	DIAMOND ATF SP III	-
Transfer oil	Hypoid gear oil API classification GL-5 or higher	-
Rear differential gear oil	Hypoid gear oil API classification GL-5 or higher • Above −23° C(−10° F): SAE90, 85W-90, 80W-90 • From −34° C to −23° C(−30° F to −10° F): SAE80W, 80W-90 • Below −34° C(−30° F): SAE75W	-
Power steering fluid	Genuine Mitsubishi Power Steering Fluid	-
Brakes fluid	Conforming to Brake fluid DOT 3 or DOT 4	-
Engine coolant	Long Life Antifreeze Coolant or an equivalent	-
Door hinges, back door hinges	Engine oil	-

LUBRICANT CAPACITY TABLE

DESCRIPTION			SPECIFICATION
Engine oil dm^3 (qt)	Oil pan (excluding oil filter)		4.0 (4.2)
	Oil filter		0.3 (0.32)
Engine coolant dm^3 (qt)			7.0 (7.4)
Transmission oil dm^3 (qt) <M/T>		F5M42	2.2 (2.32)
		W5M42	2.3 (2.43)
Transmission fluid dm^3 (qt) <A/T>		F4A4B	7.7 (8.1)
		W4A4B	8.1 (8.6)
Transfer oil dm^3 (qt)			0.53 (0.56)
Rear differential gear oil dm^3 (qt)			0.55 (0.58)
Power steering fluid dm^3 (qt)			1.0 (1.06)
Fuel tank dm^3 (gal)			59.5 (15.7)

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LUBRICANT SELECTION

ENGINE OIL

⚠ CAUTION

Never use nondetergent or straight mineral oil.

Oil Identification Symbol

Use only engine oils displaying the ILSAC certification mark ("Starburst" symbol) on the container.

ILSAC CERTIFICATION MARK ("STARBURST" SYMBOL)

ACX00394AI

API SERVICE SYMBOL

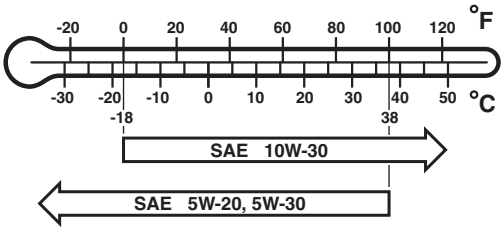
AC308969AB

If these oils are not available, an API classification SL or SL/CF can be used.

OIL VISCOSITY

The SAE grade number indicates the viscosity of the oil. A proper SAE grade number should be selected according to ambient temperature.

NOTE: SAE 5W-20, SAE 5W-30 and SAE 10W-30 engine oil can be used in outdoor temperatures ranging from -18 to 38°C (0 to 100°F). However, for optimum fuel economy and cold starting, select the low SAE viscosity grade oil for the expected temperature range. SAE 5W-20 or SAE 5W-30 engine oil is recommended.



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SELECTION OF COOLANT

COOLANT

Relationship between Coolant Concentration and Specific Gravity

⚠ CAUTION

- **If the concentration of the coolant is below 30%, the anti-corrosion property will be adversely affected. In addition, if the concentration is above 60%, both the anti-freeze and engine cooling properties will decrease, affecting the engine adversely. For these reasons, be sure to maintain the concentration level within the specified range.**
- **Do not use a mixture of different brands of anti-freeze.**

COOLANT TEMPERATURE °C (°F) AND SPECIFIC GRAVITY					FREEZING TEMPERATURE	SAFE OPERATING TEMPERATURE	COOLANT CONCENTRATION (SPECIFIC VOLUME)
10 (50)	20 (68)	30 (86)	40 (104)	50 (122)	°C (°F)	°C (°F)	%
1.054	1.050	1.046	1.042	1.036	−16 (3.2)	−11 (12.2)	30
1.063	1.058	1.054	1.049	1.044	−20 (-4)	−15 (5)	35
1.071	1.067	1.062	1.057	1.052	−25 (−13)	−20 (-4)	40
1.079	1.074	1.069	1.064	1.058	−30 (-22)	−25 (−13)	45
1.087	1.082	1.076	1.070	1.064	−36 (-32.8)	−31 (-23.8)	50
1.095	1.090	1.084	1.077	1.070	−42 (-44)	−37 (-35)	55
1.103	1.098	1.092	1.084	1.076	−50 (-58)	−45 (-49)	60

Example

The safe operating temperature is −15° C (5° F) when the specific gravity is 1.058 at the coolant temperature of 20° C (68° F)

SCHEDULED MAINTENANCE TABLE

M1001001400631

SCHEDULED MAINTENANCE SERVICE FOR EMISSION CONTROL AND PROPER VEHICLE PERFORMANCE

Inspection and service should be performed any time if a malfunction is observed or suspected.

NO.	EMISSION CONTROL SYSTEM MAINTENANCE	SERVICE INTERVALS		KILOMETERS IN THOUSANDS	24	48	72	96	120	144	168	192
				MILEAGE IN THOUSANDS	15	30	45	60	75	90	105	120
				MONTHS	12	24	36	48	60	72	84	96
1	Fuel system (tank, pipe line and connection, and fuel tank filler tube cap)	Check for leaks						X				X
2	Fuel hoses	Check condition				X*1		X		X		X
3	Air cleaner filter	Replace				X		X		X		X
4	Evaporative emission control system (except evaporative emission canister)	Check for leaks and clogging						X				X
5	Spark plugs	Standard type	Replace			X		X		X		X
		Platinum-tipped type						X				X
		Iridium-tipped type			Every 84 months or every 168,000 km (105,000 miles)							
6	Intake and exhaust valve clearance (4G6-MIVEC engine only)	Inspect and adjust If valve noise increases, adjust valve clearance				X		X		X		X
7	Timing belt	Replace			Every 96,000 km (60,000 miles) *2 *NOTE: Replace the timing belt at every 168,000 km (105,000 miles) when it has not been replaced at the first 96,000 km (60,000 miles).*							
8	Drive belts (for the generator, water pump and power steering pump)	Check condition				X		X		X		X
9	Exhaust system (connection portion of muffler, muffler pipes and converter heat shields)	Check and service				X*1		X		X		X

TSB Revision

GENERAL MAINTENANCE SERVICE FOR PROPER VEHICLE PERFORMANCE

NO.	GENERAL MAINTENANCE	SERVICE INTERVALS	KILOMETERS IN THOUSANDS	24	48	72	96	120	144	168	192
			MILEAGE IN THOUSANDS	15	30	45	60	75	90	105	120
			MONTHS	12	24	36	48	60	72	84	96
10	Engine oil	Change		Every 6 months or every 12,000 km (7,500 miles)							
11	Engine oil filter	Replace		Every 6 months or every 12,000 km (7,500 miles)							
12	Transmission oil	Check fluid level and condition			X		X		X		X
13	Transmission fluid	Check fluid level and condition			X		X		X		X
14	Transfer oil	Check oil level and condition			X		X		X		X
		Change					X				X
15	Engine coolant	Change					X at first		X		X
16	Coolant hoses (radiator hose, heater hose)	Inspect			X		X		X		X
17	Disc brake pads, rotors	Inspect for wear		Every 12 months or every 24,000 km (15,000 miles)							
18	Brake hoses	Check for deterioration or leaks		Every 12 months or every 24,000 km (15,000 miles)							
19	Ball joint and steering linkage seals	Inspect for grease leaks and damage			X		X		X		X
20	Drive shaft boots	Inspect for grease leaks and damage		Every 12 months or every 24,000 km (15,000 miles)							
21	Suspension system	Inspect for looseness and damage			X		X		X		X
22	Rear axle oil	Check oil level			X		X		X		X
23	Tires	Rotate		Every 12,000 km (7,500 miles)							
24	Air filter	Replace		Every 18 months or every 24,000 km (15,000 miles)							

NOTE:

- *[*1]: This maintenance is recommended but is not required to maintain the emissions warranty.*
- *[*2]: For California, Massachusetts, Vermot and Maine, this maintenance is recommended but is not required to maintain the emissions warranty.*

SCHEDULED MAINTENANCE UNDER SEVERE USAGE CONDITIONS

Maintenance should be carried out according to the following table:

NO.	MAINTENANCE ITEM	SERVICE INTERVALS	KILOMETERS IN THOUSANDS	24	48	72	96	120	144	168	192
			MILEAGE IN THOUSANDS	15	30	45	60	75	90	105	120
			MONTHS	12	24	36	48	60	72	84	96
3	Air cleaner filter	Replace		X	X	X	X	X	X	X	X
5	Spark plugs	Standard type	Replace	X	X	X	X	X	X	X	X
		Platinum-tipped type					X				X
		Iridium-tipped type		Every 168,000 km (105,000 miles)							
7	Timing belt	Change		Every 48 months or every 960,000 km (6,000 miles)							
10	Engine oil	Change		Every 3 months or every 6,000 km (3,750 miles)							
11	Engine oil filter	Replace		Every 3 months or every 6,000 km (3,750 miles)							
12	Transmission oil	Change oil			X		X		X		X
13	Transmission fluid	Change fluid		X check	X	X check	X	X check	X	X check	X
17	Disc brake pads, rotors	Inspect for wear		Every 6 months or every 12,000 km (7,500 miles)							
23	Tires	Rotate		Every 12,000 km (7,500 miles)							
24	Air filter	Inspect for clogging		Every 3 months or every 6,000 km (3,570 miles)							
		Replace									

Severe usage conditions:

1. Driving on dusty, rough, muddy or salt-spread roads
2. Towing or police, taxi or commercial operation
3. Extensive idling and/or low speed operation
4. Repeated short-trip operation at freezing temperatures (engine not thoroughly warmed up)
5. Extended use of brakes while driving
6. Driving in sandy areas
7. More than 50% operation in heavy city traffic during hot weather above 90° F (32° C)

MAINTENANCE SERVICE

1. FUEL SYSTEM (TANK, PIPE LINE AND CONNECTION, AND FUEL TANK FILLER TUBE CAP) (CHECK FOR LEAKS)

M1001001600141

Check for damage or leakage in the fuel lines and connections.

2. FUEL HOSES (CHECK CONDITION)

M1001001700148

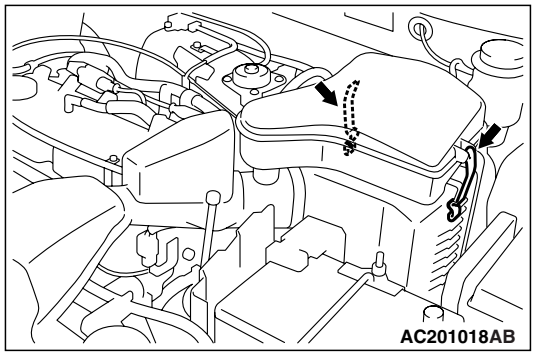
1. Inspect the surface of fuel hoses for heat and mechanical damage. Hard and brittle rubber, cracking, tears, cuts, abrasions and excessive swelling indicate deterioration of the rubber.
2. If the fabric casing of the rubber hose is exposed by cracks and abrasions in the fuel system, the hoses should be replaced.

3. AIR CLEANER ELEMENT (REPLACE)

M1001001800231

The air cleaner element will become dirty during use, reducing its effectiveness. Replace it with a new one.

REPLACEMENT OF AIR CLEANER ELEMENT



1. Unclamp the air cleaner housing.
2. Remove the air cleaner element and install a new one.
3. When clamping the air cleaner housing in place, be sure that the cover is completed closed.

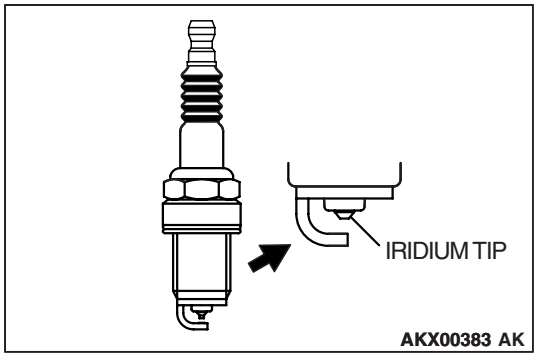
4. EVAPORATIVE EMISSION SYSTEM (EXCEPT EVAPORATIVE EMISSION CANISTER) (CHECK FOR CLOGGING)

M1001001900142

If the fuel-vapor vent line is clogged or damaged, fuel vapor will escape into the atmosphere causing excessive emissions. Disconnect the line at both ends, and blow it clean with compressed air. Remove the fuel tank filler tube cap from the filler tube and check to see if there is evidence that the seal makes improper contact to the filler tube.

5. SPARK PLUGS (REPLACE)

M1001002000391



⚠ CAUTION

Iridium plugs are used. Use care not to damage the iridium tips of the plugs. Do not adjust the spark plug gap.

1. Spark plugs must spark properly to assure proper engine performance and reduce exhaust emission level.
   Therefore, they should be replaced periodically with new ones.
   Spark plug type

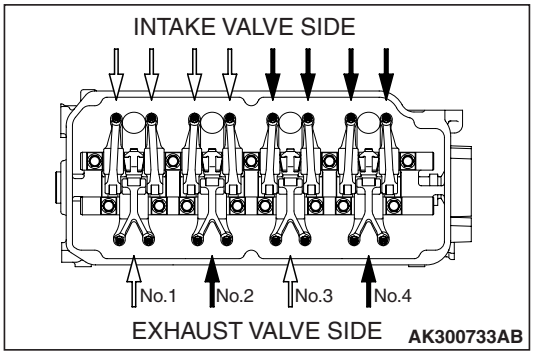
MAKER	IDENTIFCATION No.
NGK	LZFR6AI

2. The new plugs should be checked for the proper gap.
   Spark plug gap: 0.7 –0.8 mm (0.028 –0.031 inch)
3. Install the spark plugs and tighten to 25 ±4 N· m (18 ±3 ft-lb).

6. INTAKE AND EXHAUST VALVE CLEARANCE (INSPECT AND ADJUST)

M1001012900050

1. Before inspection, check that the engine oil, starter and battery are normal. Also, set the vehicle in the following condition:
   - Engine coolant temperature: 80 –95° C (176 –203° F)
   - Lights, and all accessories: OFF
   - Transaxle: P range
2. Remove all of the ignition coils.
3. Remove the rocker cover.
4. Turn the crankshaft clockwise until the notch on the pulley is lined up with "T" mark on the timing indicator.



5. Move the rocker arms on the No.1 and No.4 cylinders up and down by hand to determine which cylinder has its piston at the top dead center on the compression stroke.
   If both intake and exhaust valve rocker arms have a valve lash, the piston in the cylinder corresponding to these rocker arms is at the top dead center on the compression stroke.
6. Valve clearance inspection and adjustment can be performed on rocker arms indicated by white arrow mark when the No.1 cylinder piston is at the top dead center on the compression stroke, and on rocker arms indicated by black arrow mark when the No.4 cylinder piston is at the top dead center on the compression stroke.
7. Measure the valve clearance.
   If the valve clearance is not as specified, loosen the rocker arm lock nut and adjust the clearance using a thickness gauge while turning the adjusting screw.
   Standard value (hot engine):
   Intake valve: 0.20 mm (0.008 inch)
   Exhaust valve: 0.30 mm (0.012 inch)

8. While holding the adjusting screw with a screwdriver to prevent it from turning, tighten the lock nut to the specified torque.

   Tightening torque: 9.0 ±1.0 N· m (80 ±9 in-lb)

9. Turn the crankshaft through 360° to line up the notch on the crankshaft pulley with the "T" mark on the timing indicator.
10. Repeat steps (7) and (8) on other valves for clearance adjustment.
11. Install the rocker cover.
12. Install the ignition coils.

7. TIMING BELT (REPLACE)

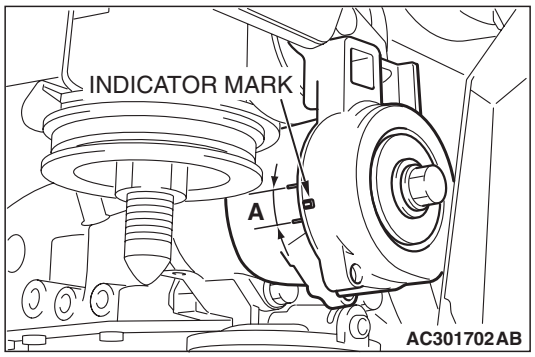
M1001002300240

Replace the belt with a new one according to the maintenance schedule P.00-38 to assure proper engine performance.
For removal and installation procedures, refer to GROUP 11A, Engine Mechanical –Timing Belt –Removal and Installation P.11A-53.

8. DRIVE BELT (FOR GENERATOR, WATER PUMP, POWER STEERING OIL PUMP) (CHECK CONDITION)

M1001002500396

⚠ CAUTION
Check the drive belt tension after turning the crankshaft clockwise one turn or more.



1. Make sure that the indicator mark is within the area marked with A in the illustration.
2. If the mark is out of the area, replace the drive belt. (Refer to GROUP 11A –Timing Belt Removal Installation P.11A-53).

   NOTE: The drive belt tension check is not necessary as auto-tensioner is adopted.

9. EXHAUST SYSTEM (CONNECTIONS PORTION OF MUFFLER, MUFFLER PIPES AND CONVERTER HEAT SHIELDS) (CHECK AND SERVICE AS REQUIRED)

M1001005800307

1. Check for holes and exhaust gas leaks due to damage, corrosion, etc.
2. Check the joints and connections for looseness and exhaust gas leaks.
3. Check the rubber hangers and brackets for damage.

10. ENGINE OIL (CHANGE)

M1001002600371

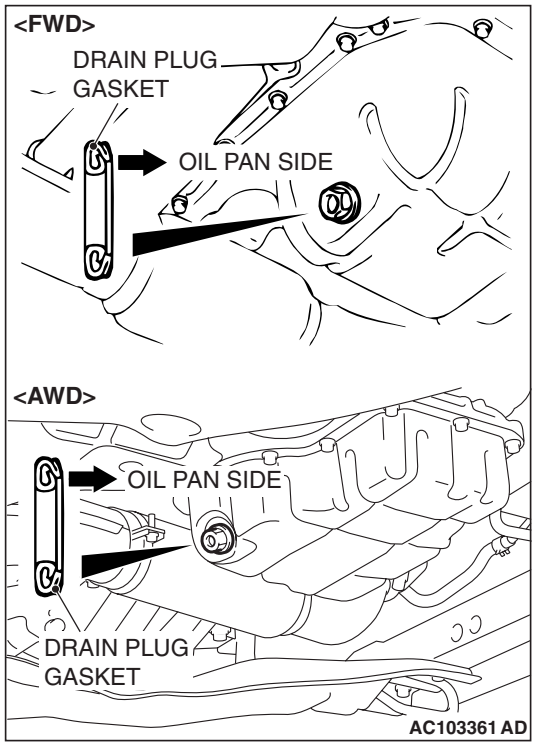
1. Start the engine and allow it to warm up until the temperature of the coolant reaches 80° C (176° F) to 90° C (194° F).

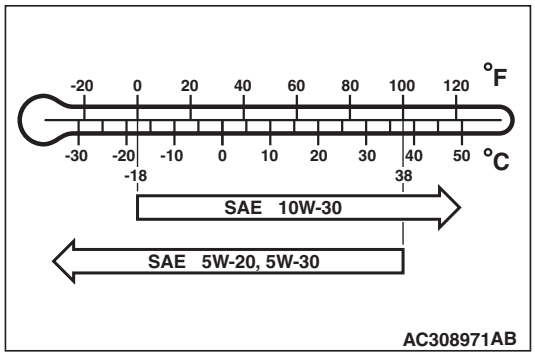
⚠ WARNING

Use care as oil could be hot.

2. Remove the engine oil filler cap.
3. Remove the drain plug to drain oil.
4. Install a new drain plug gasket so that it faces in the direction shown in the illustration, and then tighten the drain plug to the specified torque.

   Tightening torque: 39 ±5 N· m (29 ±3 ft-lb)



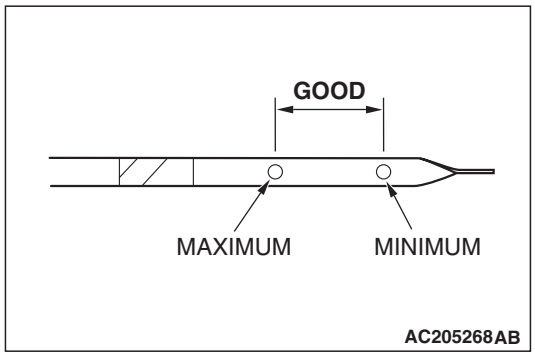


5. Refill the specified quantity of oil.

   Specified Engine Oil: Engine oils displaying ILSAC certification symbol or conforming to the API classification SL, SL/CF

   Total quantity: 4.3 dm^3 (4.5 quarts)

   NOTE: SAE 5W-20, SAE 5W-30 and SAE 10W-30 engine oil can be used in outdoor temperatures ranging from -18 to 38°C (0 to 100°F). However, for optimum fuel economy and cold starting, select the low SAE viscosity grade oil for the expected temperature range. SAE 5W-20 or SAE 5W-30 engine oil is recommended.
6. Install the engine oil filler cap.
7. Start the engine and run it at idle for a few minutes.



8. Stop the engine and check to ensure that the engine oil level is within the level range indicated on the dip stick.

11. ENGINE OIL FILTER (REPLACE)

M1001002700356

The quality of replacement filters varies considerably. Only high quality filters should be used to assure most efficient service. Genuine oil filters require that the filter is capable of withstanding a pressure of 1,765 kPa (256 psi) are high quality filters and are recommended as follows:

Mitsubishi Oil Filter Part Number: MD136466, MD322508, MD356000 or equivalent

Engine Oil Filter Selection

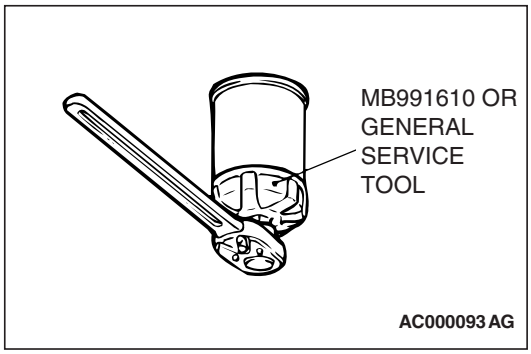
This vehicle is equipped with a full-flow, throw-away oil filter. The same type of filter is recommended as a replacement filter for this vehicle. It is possible, particularly in cold weather, that this vehicle may develop high oil pressure for a short duration. Make sure that any replacement filter used on this vehicle is a high-quality filter. The filter must withstand a pressure of 1,765 kPa (256 psi) [manufacturer's specifications] to avoid filter and ultimately engine damage. The following is a high-quality filter and is strongly recommended for use on this vehicle: Mitsubishi Engine Oil Filter Part number MD136466, MD322508 and MD356000.
Any replacement oil filter should be installed in accordance with the oil filter manufacturer's installation instructions.

Oil Filter Replacement

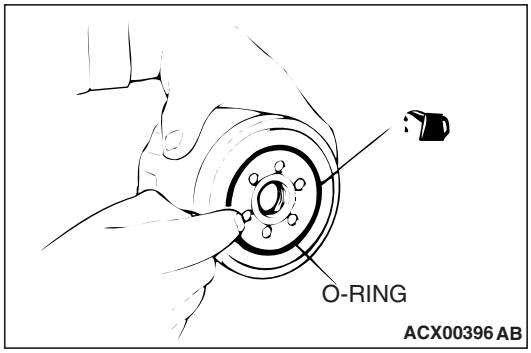
1. Start the engine and allow it to warm up until the temperature of the coolant reaches 80° C (176° F) to 90° C (194° F).

⚠ WARNING
Use care as oil could be hot.

2. Remove the engine oil filler cap.
3. Remove the drain plug to drain oil.



4. Use an oil filter wrench to remove the engine oil filter.
5. Clean the filter bracket side mounting surface and ensure the old O-ring has been removed.



6. Apply a small amount of engine oil to the O-ring of the new oil filter.
7. Screw on the oil filter by hand until it touches the surface of the flange and then tighten it with an oil filter wrench.

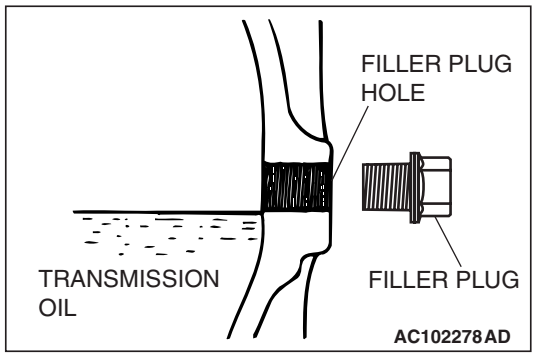
NUMBER	SPECIAL TOOL	TIGHTENING TORQUE
MD356000	MB991610 or equivalent	Approximately 3/4 turn [14 ±2 N· m (124 ±18 in-lb)]
MD136466 MD322508	General service tool	Approximately 3/4 turn [17 ±3 N· m (34 ±2 ft-lb)]

8. Install the drain plug and refill engine oil (Refer to Engine Oil Replacement P.00-44).
9. Rev the engine a few times, and check to be sure that no engine oil leaks from the installation section of the oil filter.

12. MANUAL TRANSAXLE OIL

M1001002800278

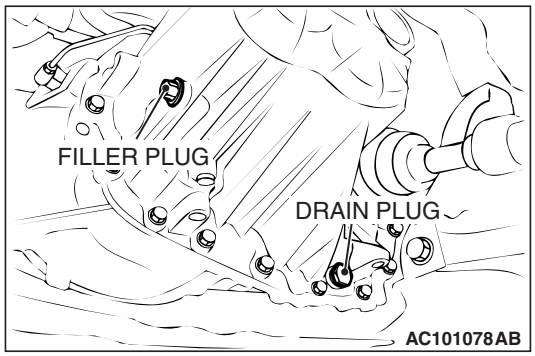
CHECKING TRANSAXLE OIL LEVEL



1. Remove the filler plug.
2. Check that the oil level is up to the lower edge of the filler plug hole.
3. Check that the oil is not noticeably dirty.
4. Tighten the filler plug to the specified torque.

Tightening torque: 32 ±2 N· m (24 ±1 ft-lb)

TRANSAXLE OIL REPLACEMENT

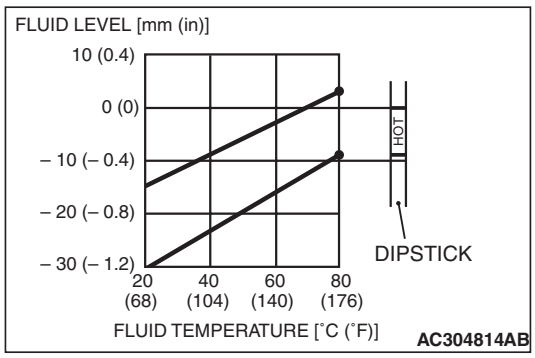


1. Remove the filler plug.
2. Remove the drain plug and drain the oil.
3. Tighten the drain plug to the specified torque.
   Tightening torque: 32 ±2 N· m (24 ±1 ft-lb)
4. Fill with DiaQueen NEW MULTI GEAR OIL API classification GL-3 SAE 75W-80 or gear oil API classification GL-4 SAE 75W –85W or 75W –90 until the level comes to the lower portion of filler plug hole.
   Quantity: 2.2 dm^3 (2.32 quarts) <FWD>
   Quantity: 2.3 dm^3 (2.43 quarts) <AWD>
5. Tighten the filler plug to the specified torque.
   Tightening torque: 32 ±2 N· m (24 ±1 ft-lb)

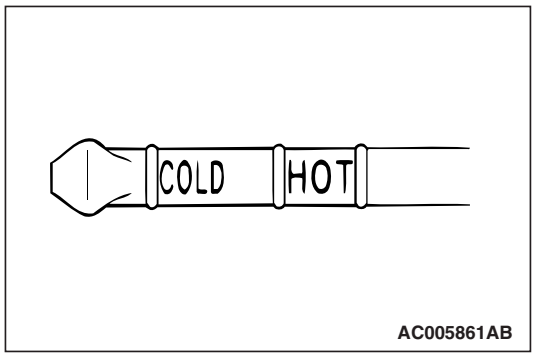
13. TRANSMISSION FLUID

M1001002900446

CHECKING TRANSMISSION FLUID LEVEL



1. Drive the vehicle until the transmission fluid temperature rises to the normal operating temperature [70 –80° C (158 – 176° F)].
   NOTE: The transmission fluid temperature is measured with scan tool MB991958 (MUT-III sub assembly).
   NOTE: If it takes some amount of time until the transmission fluid reaches its normal operating temperature [70 –80 °C (158 –176 °F)], check the transmission fluid level by referring to the left diagram.
2. Park the vehicle on a level surface.
3. Move the selector lever through all positions to fill the torque converter and the hydraulic circuits with fluid, and then move the selector lever to the "N" position.
4. After wiping off any dirt around the dipstick, remove the dipstick and check the condition of the transmission fluid.
   NOTE: If the transmission fluid smells as if it is burnt, it means that the transmission fluid has been contaminated by fine particles from the bushings and friction materials. Transaxle overhaul and cooler line flushing may be necessary.



5. Check transmission fluid level is at the "HOT" mark on the dipstick. If the transmission fluid level is less than this, add DIAMOND ATF SP III transmission fluid until the level reaches the "HOT" mark.
   NOTE: If the transmission fluid level is too low, the oil pump will draw in air along with the transmission fluid, which will cause to form bubbles. If the transmission fluid level is too high, rotating components inside the transaxle will churn the fluid and air into a foamy liquid. Both conditions (level too low or too high) will cause the hydraulic pressure to drop, which will result in late shifting and slipping of the clutches and brakes.

NOTE: In either case, air bubbles can interfere with normal valve, clutch, and brake operation. Also, foaming can cause transmission fluid to escape from the transaxle vent where it may be mistaken for a leak.

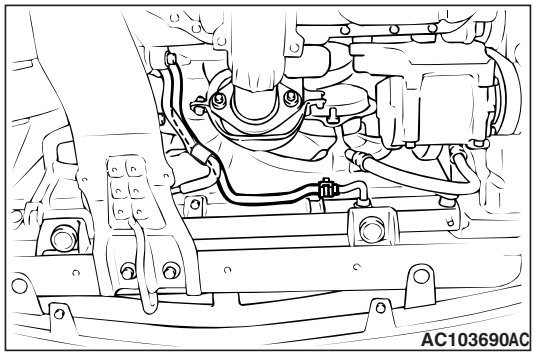
6. Securely insert the dipstick.

NOTE: The transmission fluid should always be replaced under the following conditions:

- *When troubleshooting the transaxle.*
- *When overhauling the transaxle.*
- *When the transmission fluid is noticeably dirty or burnt (driving under severe conditions).*

CHANGE TRANSMISSION FLUID

If you have an transmission fluid changer, use this changer to replace the transmission fluid. If you do not have an transmission fluid changer, replace the transmission fluid by the following procedure.


AC103690AC

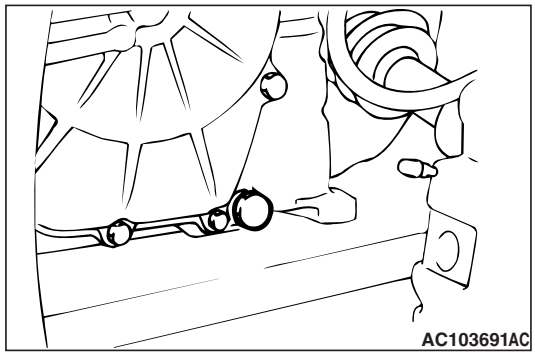
1. Disconnect the hose shown in the illustration which connects the transaxle and the oil cooler (inside the radiator). Place a container under the hose to collect the discharge.

⚠ CAUTION

The engine should be stopped within one minute after it is started. If all the transmission fluid has drained out before then, the engine should be stopped at that point.

2. Start the engine and let the transmission fluid drain out. (Running conditions: "N" range with engine idling)

   Approximately 3.5 dm^3 (3.7 quarts) of transmission fluid should be removed.


AC103691AC

3. Remove the drain plug from the bottom of the transaxle case to drain the transmission fluid.

   Approximately 2.0 dm^3 (2.1 quarts) of transmission fluid should be removed.

4. Install the drain plug with a new gasket, and tighten it to the specified torque.

   Tightening torque: 32 ±2 N· m (24 ±1 ft-lb)

⚠ CAUTION

Stop pouring if the full volume of transmission fluid cannot be added.

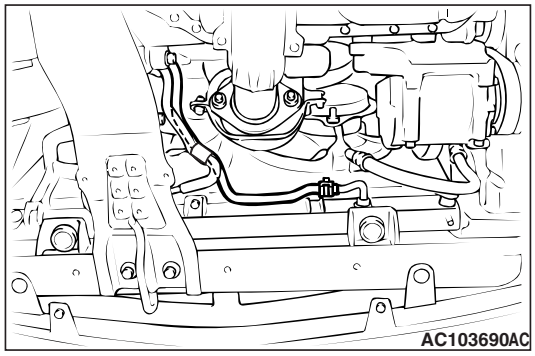
5. Add new transmission fluid (DIAMOND ATF SP III) through the oil filter tube.

   Approximately 5.5 dm^3 (5.8 quarts) of transmission fluid should be added.

6. Repeat the procedure in Step 2. (to pump out the rest of the contaminated transmission fluid)
7. Add new transmission fluid (DIAMOND ATF SP III) through the oil filter tube.

Approximately 3.5 dm^3 (3.7 quarts) of transmission fluid should be added.

NOTE: Check for contamination or a burnt odor. If the transmission fluid is still contaminated or burnt, repeat Steps 6 and 7 before proceeding to Step 8.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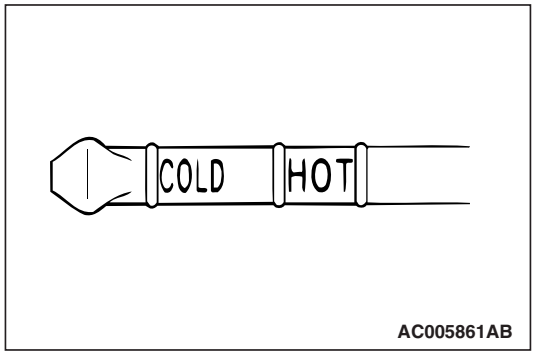
8. Reconnect the hose which was disconnected in step 1 above, and firmly replace the dipstick.
9. Start the engine and run it at idle for one to two minutes.
10. Move the selector lever through all positions, and then move it to the "N" position.



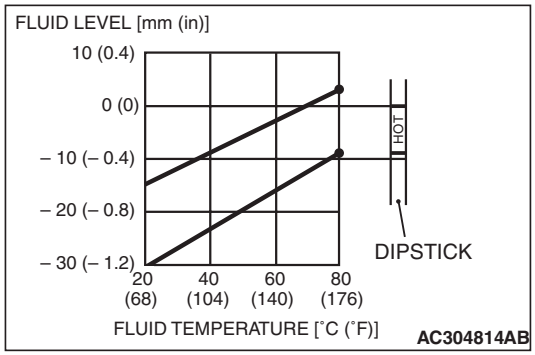
AC005861AB

11. Check that the transmission fluid level is at the "COLD" mark on the dipstick. If the level is less than this, add transmission fluid.
12. Drive the vehicle until the transmission fluid temperature rises to the normal operating temperature [70 –80° C (158 – 176° F)], and then check the transmission fluid level again. The transmission fluid level must be at the "HOT" mark.

    NOTE: The transmission fluid temperature is measured with scan tool MB991958 (MUT-III sub assembly).

    NOTE: The "COLD" level is for reference only; the "HOT" level should be regarded as the standard level.

    NOTE: If it takes some amount of time until the transmission fluid reaches its normal operating temperature [70 –80°C (158 –176°F)], check the transmission fluid level by referring to the left diagram.



AC304814AB

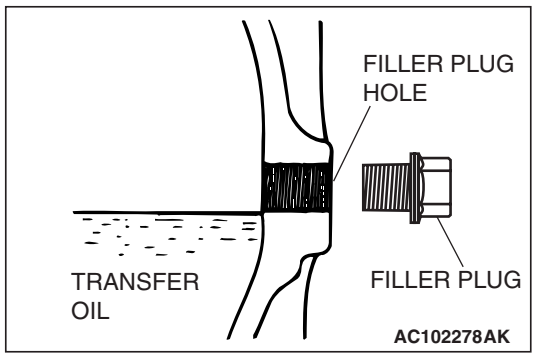
13. When the transmission fluid is less than the specified level, add transmission fluid.

    When the transmission fluid is greater than the specified level, drain the excess fluid through the drain plug to adjust the transmission fluid to the specified level.
14. Firmly insert the dipstick into the oil filler tube.

14. TRANSFER OIL

M1001003000178

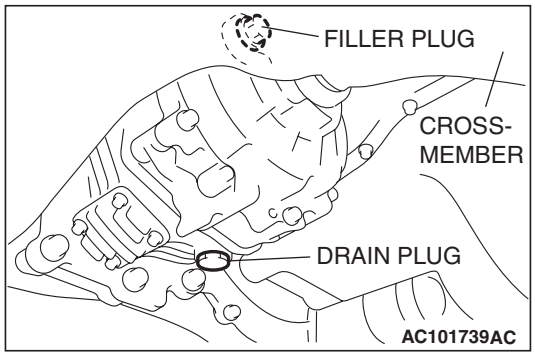
Checking transfer oil level



1. Remove the filler plug.
2. Check that the oil level is up to the lower edge of the filler plug hole.
3. Check that the oil is not noticeably dirty.
4. Tighten the filler plug to the specified torque.

   Tightening torque: 32 ±2 N· m (24 ±1 ft-lb)

Change transfer oil



1. Remove the drain plug and discharge the oil.
2. Tighten the drain plug to the specified torque.

   Tightening torque: 32 ±2 N· m (24 ±1 ft-lb)

⚠ CAUTION

Cover the heat protector of the front exhaust pipe with cardboard or something similar when refilling transfer oil so that transfer oil dose not enter the area between the front exhaust pipe and heat protector.

3. Fill oil to the bottom of the filler plug hole.

   Specified oil: Hypoid gear oil API classification GL-5 SAE90

   Quantity: 0.53 dm^3 (0.56 quart)

4. Tighten the filler plug to the specified torque.

   Tightening torque: 32 ±2 N· m (24 ±1 ft-lb)

15. ENGINE COOLANT (CHANGE)

M1001003100465

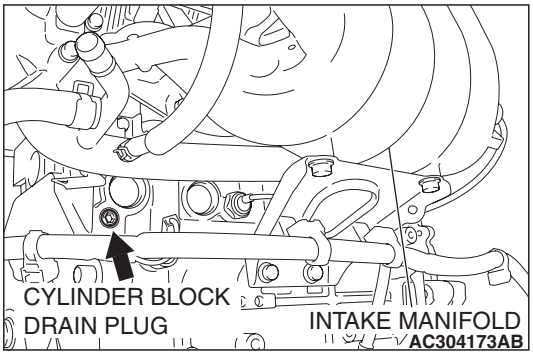
Check the cooling system parts such as the radiator, heater and oil cooler hoses, thermostat and their connections for leakage and damage.

Chang Coolant

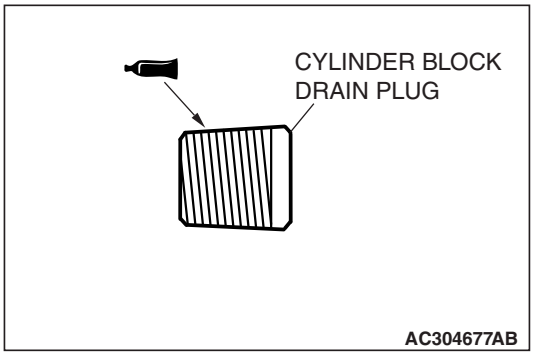
⚠ WARNING

When removing the radiator cap, use care to avoid contact with hot coolant or steam. Place a shop towel over the cap and turn the cap counterclockwise a little to let the pressure escape through the vinyl tube. After relieving the steam pressure, remove the cap by slowly turning it counterclockwise.

1. Drain the water from the radiator, heater core and engine after unplugging the radiator drain plug and removing the radiator cap.



2. Drain the water in the water jacket by unplugging the drain plug of the cylinder block.
3. Remove the reserve tank and drain the coolant.
4. Drain the cooling water then clean the path of the cooling water by injecting water into the radiator from the radiator cap area.



5. Apply the designated sealant to the screw area of the cylinder block drain plug, and then tighten to the standard torque.

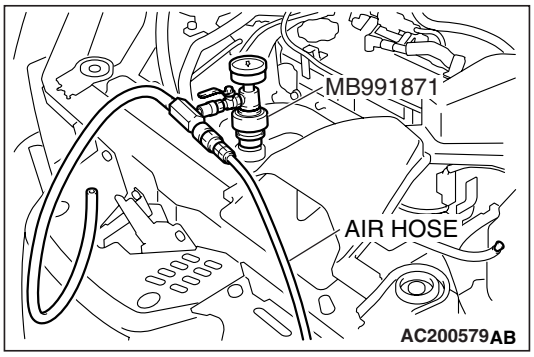
   Specified sealant: 3M™ AAD Part No.8731 or equivalent

   Tightening torque: 44 ±5 N· m (33 ±3 ft-lb)

6. Securely tighten the drain plug of the radiator.
7. Assemble the reservoir tank.

⚠ CAUTION

Do not use alcohol or methanol anti-freeze or any engine coolants mixed with alcohol or methanol anti-freeze. The use of an improper anti-freeze can cause corrosion of the aluminum components.



8. By referring to the section on coolant, select an appropriate concentration for safe operating temperature within the range of 30 to 60 %. Use special tool MB991871 to refill the coolant. A convenient mixture is a 50 % water and 50 % antifreeze solution [freezing point: −31° C (−32.8 °F)].

   Recommended antifreeze: Long Life Antifreeze Coolant or an equivalent

   Quantity: 7.0 dm^3 (7.4 quarts)

   NOTE: For how to use special tool MB991871, refer to its manufacturer's instructions.

9. Reinstall the radiator cap.
10. Start the engine and let it warm up until the thermostat opens.
11. After repeatedly revving the engine up to 3,000 r/min several times, then stop the engine.
12. Remove the radiator cap after the engine has become cold, and pour in coolant up to the brim. Reinstall the cap.

⚠ CAUTION

Do not overfill the reserve tank.

13. Add coolant to the reserve tank between the "FULL" and "LOW" mark if necessary.

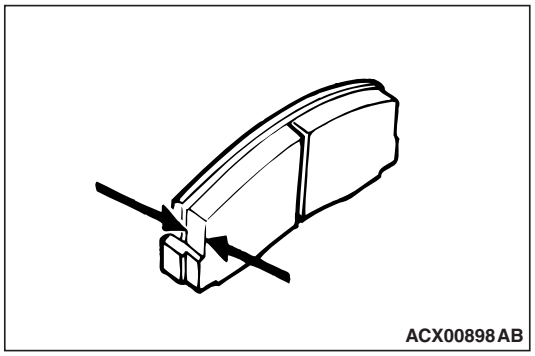
16. COOLANT HOSES (RADIATOR HOSE, HEATER HOSE) (INSPECT)

M1001009700108

Inspect the surface of radiator hoses and heater hoses for heat and mechanical damage. Hard and brittle rubber, cracking, tears, cuts, abrasions and excessive swelling indicate deterioration of the rubber.

17. DISC BRAKE PADS (INSPECT FOR WEAR)

M1001003200365


ACX00898AB

Check for fluid contamination and wear. Replace the complete set of pads if any one pad is defective.

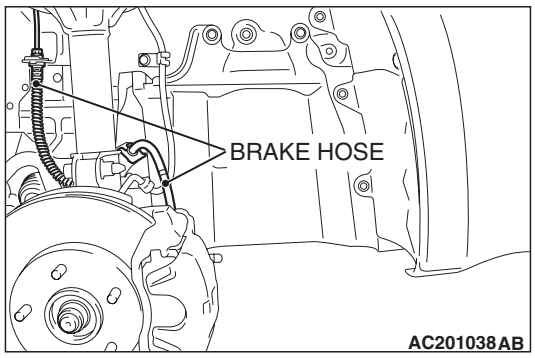
Thickness of lining
Minimum limit: 2.0 mm (0.08 inch)

⚠ CAUTION

The pads for the right and left wheels should be replaced at the same time. Never split or intermix brake pad sets. All four pads must be replaced as a complete set.

18. BRAKE HOSES (CHECK FOR DETERIORATION OR LEAKS)

M1001003400411



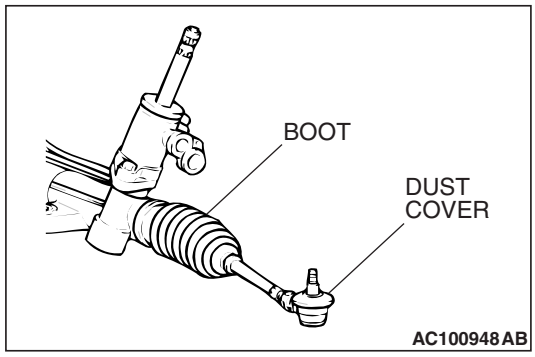
AC201038AB

Inspection of brake hoses should be included in all brake service operations.
The hoses should be checked for:

1. Incorrect length, severe surface cracking, pulling, scuffing or worn spots. (If the fabric casing of the hoses is exposed by cracks or abrasion in the rubber hose cover, the hoses should be replaced. Eventual deterioration of the hose and possible bursting failure may occur).
2. Incorrect installation, twisting or interference with wheel, tire or chassis.

19. BALL JOINT AND STEERING LINKAGE SEALS (INSPECT FOR GREASE LEAKS AND DAMAGE)

M1001003500429

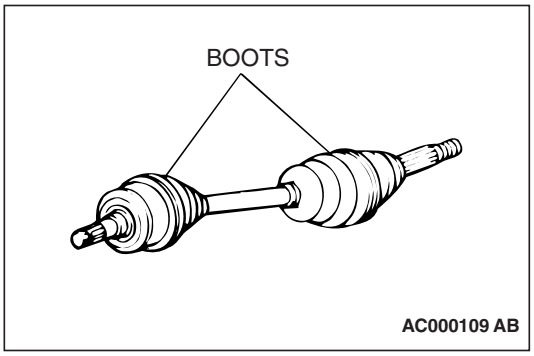


AC100948AB

1. These components, which are permanently lubricated at the factory, do not require periodic lubrication. Damaged seals and boots should be replaced to prevent leakage or grease contamination.
2. Inspect the dust cover and boots for proper sealing, leakage and damage, and replace them if defective.

20. DRIVE SHAFT BOOTS (INSPECT FOR GREASE LEAKS AND DAMAGE)

M1001003600415



1. These components, which are permanently lubricated at the factory, do not require periodic lubrication. Damaged seals and boots should be replaced to prevent leakage or grease contamination.
2. Inspect the dust cover and boots for proper sealing, leakage and damage. Replace them if defective.

21. SUSPENSION SYSTEM (INSPECT FOR LOOSENESS AND DAMAGE)

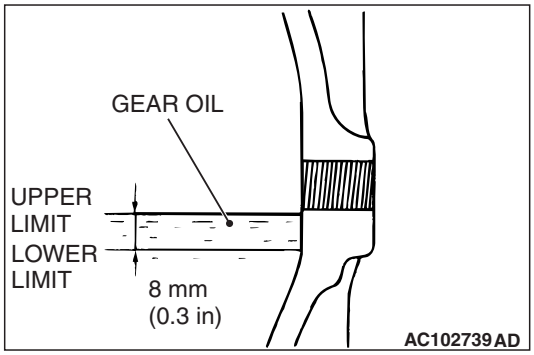
M1001009600145

Visually inspect the front/rear suspension components for deterioration and damage. Re-tighten the front/rear suspension components retaining bolts to specified torque.

22. REAR AXLE OIL (CHECK OIL LEVEL)

M1001007500119

REAR DIFFERENTIAL OIL CHECK

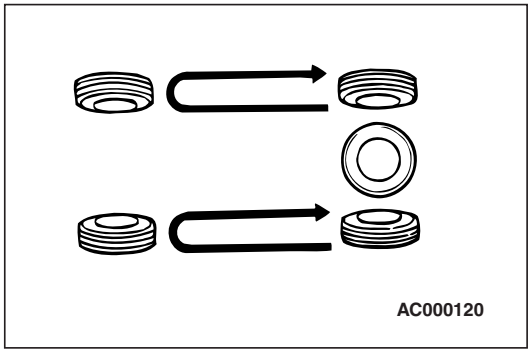


Check that gear oil level is not 8 mm (0.3 inch) below the bottom of filler plug hole.

Specified gear oil: Hypoid gear oil API classification GL-5 or higher
Above −23° C(−10° F): SAE90, 85W-90, 80W-90
From −34° C to −23° C(−30° F to −10° F): SAE80W, 80W-90
Below −34° C(−30° F): SAE75W

23. TIRES (ROTATE)

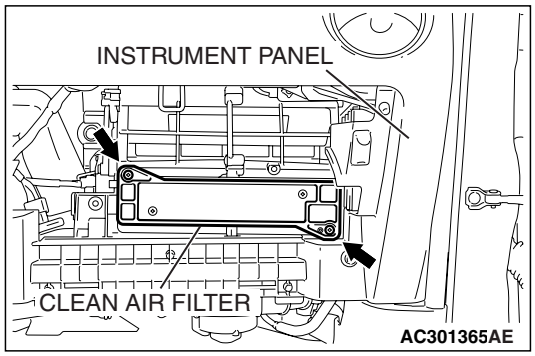
M1001008900444



Rotate tires regularly to equalize tire wear and help extend tire life. Recommended tire rotation is every 12,000 km (7,500 miles).
Timing for the rotation may vary according to vehicle condition, road surface conditions, and individual driver's habits.
When rotating tires, check for uneven wear, damage, and wheel alignment. Abnormal wear is usually caused by incorrect tire pressure, improper wheel alignment, out-of balance wheels, or severe braking.
The first rotation is the most important, to achieve more uniform wear for all tires on the vehicle.

24. AIR FILTER (REPLACE)

M1001009000080



1. Remove the glove box. (Refer to GROUP 52A –Instrument Panel P.52A-18)
2. Remove the two screws as shown, and replace the clean air filter.
3. Install the glove box.

MAIN SEALANT AND ADHESIVE TABLE

M1001003800420

APPLICATION		3M™ NO.	LOCTITE®/ PERMATEX®NO.
ENGINE AND DRIVETRAIN	Between rocker cover and camshaft bearing cap. Between rocker cover, semicircular packing and cylinder head. Between oil pressure switch and engine.	3M™ AAD Part No. 8672 Ultrapro High Temp. Silicone Gasket or 3M™ AAD Part No. 8679 Black/8678 Black Press-In-Place Silicone gasket strips	Permatex® Ultra Black 598, No.82180
	Between engine coolant temperature switch, engine coolant temperature sensor, thermo valve, thermo switch, joint, engine coolant temperature gauge unit (large-size) and engine	3M™ AAD Part No. 8731 Medium Strength Blue Threadlocker	Loctite®242 Blue Service Tool Removable 24200
	Between oil pan and engine block	3M™ AAD Part No. 8672, 3M™ AAD Part No. 8704 or 3M™ AAD Part No. 8679/8678	Permatex® Ultra Gray 599, No.82194
WEATHERSTRIPPING FOR GLASS	Between tempered glass, body flanges, and weatherstrip	3M™ AAD Part No. 8509 Auto Bedding and Glazing Compound or 3M™ AAD Part No. 8633 Windo-weld Resealant	-
WEATHERSTRIPPING FOR GLASS	Between laminated glass and weatherstrip	3M™ AAD Part No. 8633	-

APPLICATION		3M™ NO.	LOCTITE®/ PERMATEX®NO.
INTERIORS	Adhesive of vinyl chloride cloth	3M™ AAD Part No. 8088 General Trim Adhesive or 3M™ AAD Part No. 8064 Vinyl Trim Adhesive	Permatex® Vinyl Repair Kit No.81786
	Adhesion of door weatherstrip	3M™ AAD Part No. 8001 (yellow) or 3M™ AAD Part No. 8008 (black) Super Weatherstrip Adhesive or 3M™ AAD Part No. 8011 Black Weatherstrip Adhesive	Permatex® Super Black Weatherstrip Adhesive No.82, 81850
	Sealing of various grommets and packing	3M™ AAD Part No. 8509 or 3M™ AAD Part No. 8678	-
	Adhesion of headliners and various interior decorative materials	3M™ AAD Part No. 8088 General Trim Adhesive or 3M™ AAD Part No. 8090 Super Trim Adhesive	Permatex® Spray Adhesive No.82019
BODY SEALANTS	Sealing of sheet metal joints, drip rail, floor, side panels, trunk, front panel, tail gate hinge	3M™ AAD Part No. 8531 Heavy Drip-Check Sealer (gray) or 3M™ AAD Part No. 8302 Ultrapro Autobody Sealant (clear) or 3M™ AAD Part No. 8361 Urethane A/B Sealant (gray or white)	-
	Miscellaneous body sealants (original mounted w/adhesive tape) • Waterproof door film • Fender panel • Splash shield • Mud guard • Rear combination lamp	3M™ AAD Part No. 8633 Windo-weld Resealant	-
	Fuel Tank and Pad	3M™ AAD Part No. 8088 General Trim Adhesive or 3M™ AAD Part No. 8090 Super Trim Adhesive	Permatex® Spray Adhesive No.82019

APPLICATION		3M™ NO.	LOCTITE®/ PERMATEX®NO.
CHASSIS SEALANT	Sealant of various flange faces and threaded parts. Packing of fuel gauge unit	3M™ AAD Part No. 8730 High Strength Red Threadlock or 3M™ AAD Part No. 8731 Medium Strength Blue Threadlocker	Loctite®272 High Strength and High Temperature 27200
	Sealing of various threaded parts, dust covers. Differential carrier packing, dust covers and ball joint and linkage. Packing and shims of steering box, sealing of rack support cover and top cover of steering box housing, seal of junction face of knuckle arm flange	3M™ AAD Part No. 8672 Ultrapro High Temp. Silicone Gasket or 3M™ AAD Part No. 8679 (black) or 3M™ AAD Part No. 8678 (black) Press-In-Place Silicone gasket strips 3M™ AAD Part No. 8661 or 3M™ AAD Part No. 8663 Super Silicone sealant	Permatex® The Right Stuff No.25223
	Seal of brake shoe hold down pin and wheel cylinder of drum brakes	3M™ AAD Part No. 8633 Windo-weld Resealant	-
QUICK FIX ADHESIVE	-	3M™ AAD Part No. 8155 Quick Fix Adhesive	Loctite®Quicktite Super Glue 21309
ANAEROBIC STRONG SEALING AGENT	Fixing of various threads, bolts, screws. Fixing of differential drive gear bolt, Connecting of tilt steering bolt. Fan, pulley, gear Sealing of small gaps and flange faces	3M™ AAD Part No. 8730 High Strength Threadlocker or 3M™ AAD Part No. 8731 Medium Strength Threadlocker	Loctite®271, High-Strength Threadlocker 27100 or 27200
UNDER COATING AGENT	-	3M™ AAD Part No. 8883 Rubberized Undercoating Aerosol or 3M™ AAD Part No. 8864 Body Schutz Undercoating (qt)	Permatex® Heavy-Duty Undercoating 81833